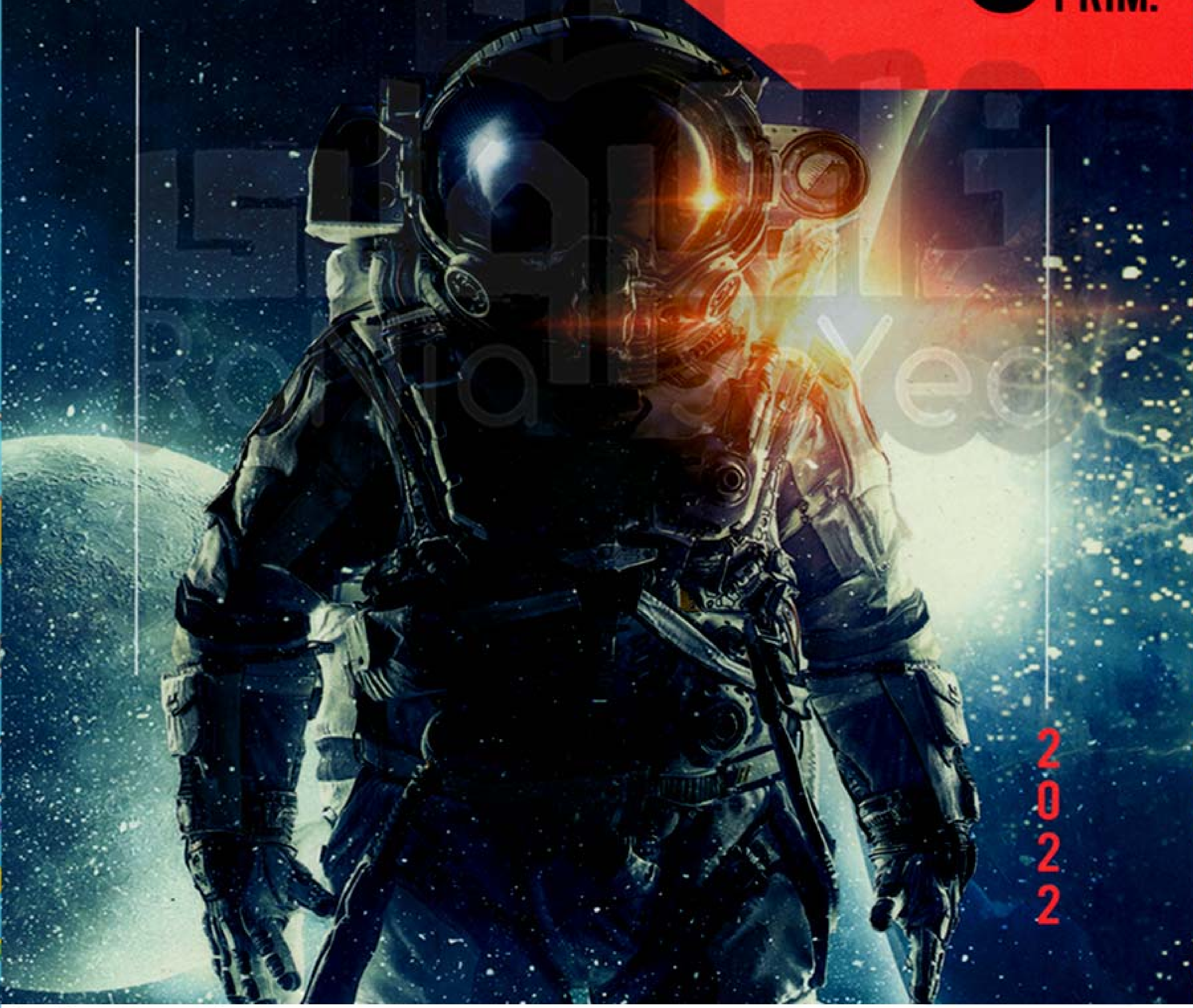
AL ADWAA
Gem

مذاكرتك ديجيتال

SCIENCE

FIRST TERM

6th PRIM.



2022

Unit 1

FORCE AND MOTION

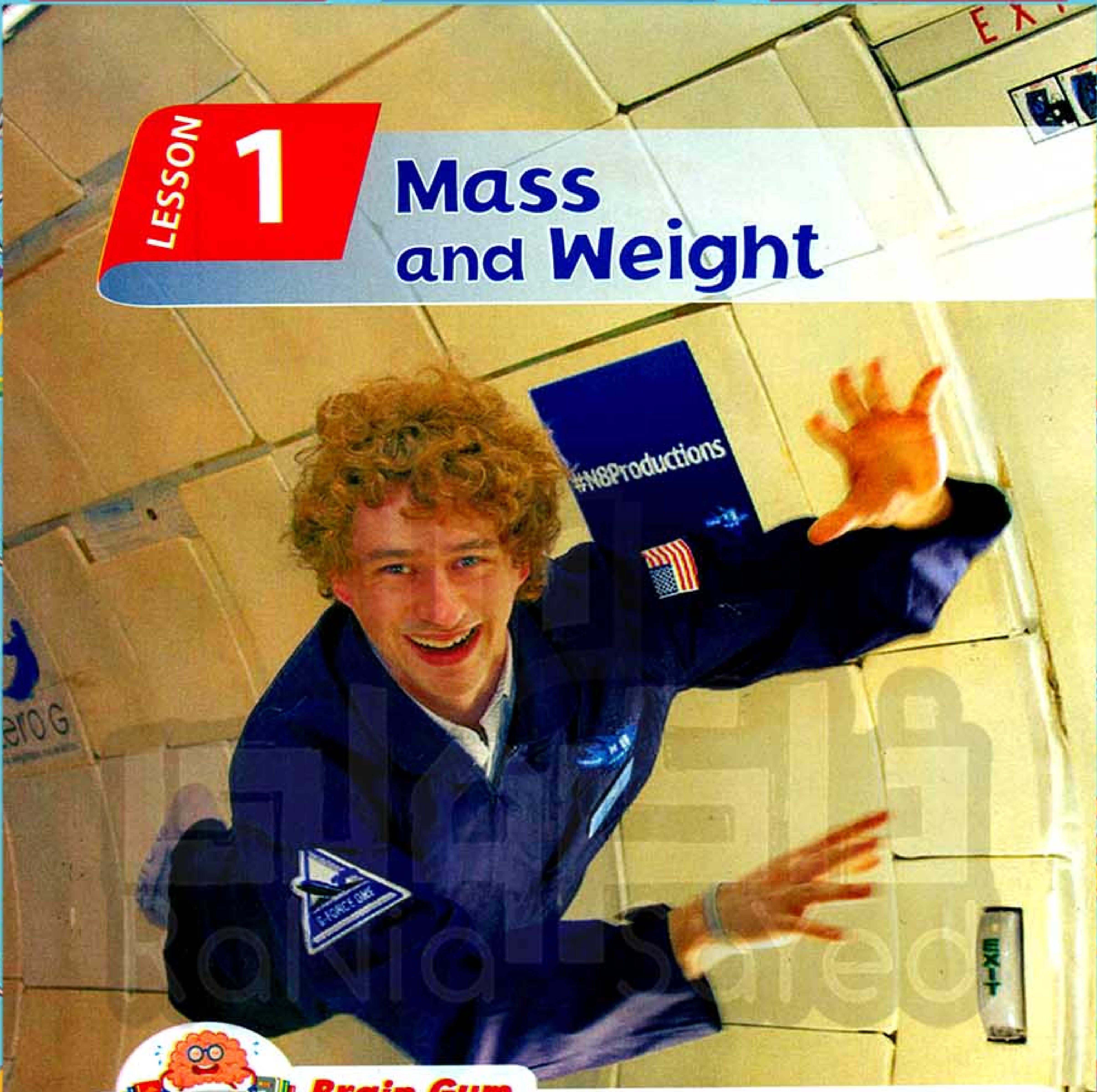


Lesson 1 Mass and Weight

Objectives:

- Identifying the concept of mass.
- Learning how to measure mass.
- Identifying the concept of weight.
- Naming factors affecting weight.
- Comparing between mass and weight.
- Understanding the relation between mass and weight.
- Applying the rule of: [weight (Newton) = mass (kg) x 10].

LESSON 1 Mass and Weight



Brain Gym



- One of the common mistakes you always do is, when you step on a scale, you say my weight is 50 kilograms which is the measuring unit of mass. But in fact, there is a difference between mass and weight.
- **Let's start by learning the difference between mass and weight.**

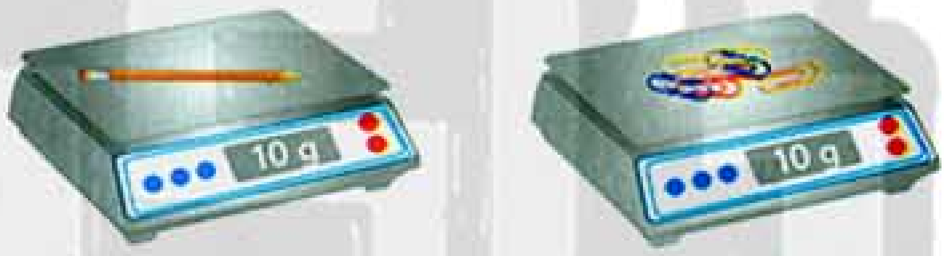
Mass

▸ Look at the following exercise, to discover the concept of mass:

Exercise

Case	Yes	No
1. Does the mass of 3 pieces of fruit equal the mass of 5 pieces of the same kind?		✓
2. Does the mass differ according to the amount of fruits?	✓	
3. Does the mass of the clips equal the mass of the pencil?	✓	





Coclusion

The mass of objects depends on the amount of matter.

Mass : It is the amount of matter in an object.

NOTE

• The more matter an object contains, the greater mass it has.

Check point 1

Choose the correct answer: *(Answer Guide: P. 2)*

1. The amount of matter in an object is ....
   a. weight b. gravity c. mass d. volume
2. Which has the most mass? ....
   a. A pencil case b. A school bag
   c. A pencil d. A mobile phone



Lesson 1

1. Properties of mass:

1. The mass of an object increases when the amount of matter increases and vice versa.
2. All types of matter have mass regardless of their:
   - Physical state (solid, liquid or gas).
   - Shape (pieces, powder, mixture, and pure substance).
   - Place (in hand, on the moon, on any planet, etc.).
3. The mass of any matter is a fixed value (constant) that does not change by changing its place or its physical state.

NOTE

- The mass of an astronaut wearing his suit does not change by changing the place:



Mass = 100 kg



Mass = 100 kg



Mass = 100 kg

What is meant by ...?

1. The mass of a gold ring = 3 gm.



It means that the amount of gold in the ring = 3 gm.

2. The amount of wood in a chair = 5 kg.



It means that the mass of the chair = 5 kg.

2. Measurement units of mass:

1 Gram (gm)



- It is used to measure small masses such as: jewelry.
- One gram is equal to the mass of one paper clip.

2 Kilogram (kg)



- It is used to measure large masses such as: fruits and vegetables.
- One kilogram is equal to one liter of distilled water.

3 Ton



- It is used to measure very large masses such as: cars.

NOTE

- Kilogram = **1000** grams
- Ton = **1000** kilograms

Gram (gm) → ÷1000 → Kilogram (kg) → ÷1000 → Ton

Ton → ×1000 → Kilogram (kg) → ×1000 → Gram (gm)

Check point 2 Answer the following: *(Answer Guide: P. 2)*

1. 5000 gm = ... kg
2. 845 kg = ... gm
3. 250 kg = ... ton
4. 2500 gm = ... kg



3. Measurement devices of mass:

- Mass is measured by different types of scales.
- Each type of the following scales is suitable for measuring certain kinds of materials according to the quantity of the material we want to measure.

Types of scales

1 Two-arm scales



Sensitive scale for small masses **such as: gold and chemicals**



Balance scale "two-pan scale" for large masses **such as: fruits and vegetables**

2 One-arm scales



One-arm digital scale for small masses **such as: gold and chemicals**



One-arm scale with a pointer for large masses **such as: fruits and vegetables**

Enrichment information

There is a relation between the mass and the speed of motion. This means that when the mass of an object increases, it is more difficult to change its speed.

Ex. The bus has bigger mass than that of the car. So, the bus needs more force to stop than the force that the car needs.



Check point 3 Complete the following sentences:

(Answer Guide: P. 2)

1. The mass of any object is a .... value that doesn't change by changing its .... or .... *(Cairo 2019)*

2. .... and .... scales are used to measure small masses.



Activity

To show how to measure the mass of a solid object by using a balance scale:

Materials: A balance scale – standard masses – an object to be measured.

Steps	Illustration
1. Place a clean balance scale horizontally on a stable table. 2. Put the object on one arm. 3. Put the standard masses on the other arm till the two arms balance.	

Conclusion

The object's mass = the total mass of the standard masses which balance with the object

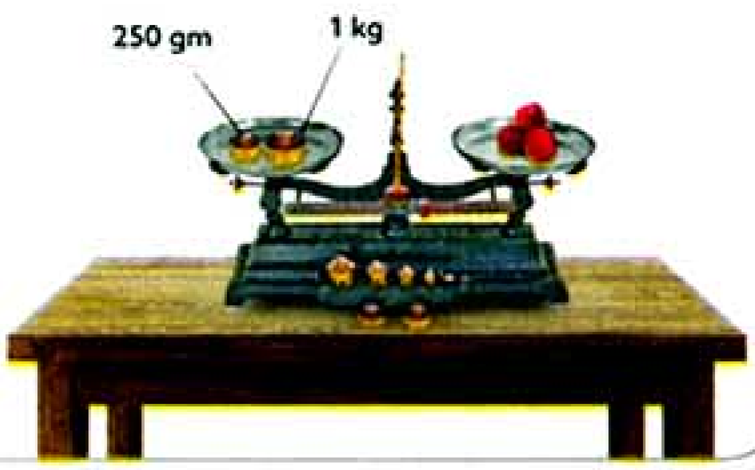
NOTE
When adding the standard masses, we must be sure that the masses used are similar in units.

G.R. Balance scale should be horizontal on a stable table.

To avoid vibration.

Problems

Calculate the total mass of the fruits.



Answer:

Standard mass (1) = 1 kg

Standard mass (2) = 250 gm = 250 ÷ 1000 = $\frac{1}{4}$ kg

$\therefore$ The mass of the fruits = 1 kg + $\frac{1}{4}$ kg

= $1\frac{1}{4}$ kg

Lesson 1

Activity

To know how to measure the mass of a liquid by using a digital scale:

Materials: A digital scale – a glass beaker – an amount of water.

Steps	Illustration
1 Put a clean digital scale horizontally on a stable table to avoid any vibration. 2 Record the mass of the empty beaker by using the digital scale (M_1).	
3 Put the amount of water that you need to measure in the beaker and record the total mass (M_2). 4 Calculate the difference between M_2 and M_1.	

Conclusion

The mass of the liquid = the mass of the beaker with the liquid – the mass of the empty beaker

The mass of the liquid = M_2 – M_1

= 150 – 50 = 100 gm

Problems

1. **Calculate the mass of water in the figure below if the mass of the empty beaker equals 150 grams.**



Answer:

The mass of empty beaker (M_1) = 150 gm

The mass of the beaker with water (M_2) = 370 gm

∴ The mass of water = M_2 – M_1

= 370 – 150 = 220 gm

2. **Calculate the mass of water in the beaker shown in the figure below.**



Answer:

The mass of the empty beaker (M_1) = 100 gm

The mass of the beaker with water (M_2) = 175 gm

∴ The mass of water = M_2 – M_1

= 175 – 100 = 75 gm

Benchmark

Selected from Previous Exams

(Answer Guide: P. 2)



1. Write the scientific term for each of the following:

1. The amount of matter in an object. (..............................) *(Beheira 2020)*
2. The measurement unit which is equal to the mass of one paper clip. (..............................) *(Suez 2016)*
3. The measuring unit of mass which equals one liter of distilled water. (..............................) *(Cairo 2020)*
4. The device that is used to measure the mass. (..............................) *(Cairo 2018)*

2. Complete the following sentences:

1. The mass is a constant value and is not affected by .... *(Qalubia 2020)*
2. The mass of an object .... when the amount of matter increases in it. *(Cairo 2020)*
3. Mass is measured by different types of scales such as .... and .... *(Cairo 2020)*
4. The measurement units of mass are .... and .... *(Dakahlia 2016)*

3. Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

1. Mass is measured by spring scale. *(Qalubia 2020)* ( )
2. One kilogram equals 1000 grams which equal one liter of distilled water. *(Dakahlia 2017)* ( )
3. The grocer's balance can be used to measure the mass of gold. *(Cairo 2019)* ( )
4. An object's mass is equal to total masses of the scale's standard masses. *(Cairo 2019)* ( )

4. Give reason for each of the following:

- The mass of an object on the earth equals its mass on the moon. *(Giza 2020)*

....

5. Correct the underlined words:

1. The object's mass on the moon is <u>one sixth</u> its mass on the earth. *(Cairo 2020)* (..............................)
2. The digital scale is used to measure <u>weight</u>. *(Menofia 2016)* (..............................)

TRY TO SOLVE
Worksheet 1
Page 3

Weight

▶ To discover the concept of weight, look at the following pictures, then circle the answer:



- If you carry your pen and leave it, will it fall down?
  ▶ Yes / No



- Does a person fall down when he jumps up from the earth's surface?
  ▶ Yes / No



- Does the astronaut fall down when he jumps from a high position?
  ▶ Yes / No
- If the astronaut carries something and leaves it, will it fall down?
  ▶ Yes / No

From all the previous pictures, we can conclude that:



▶ There is a force that always attracts objects towards the center of the earth. When you throw up an object, it falls down towards the earth.

▶ All objects have weights, but in space all objects are in a state of weightlessness as in a spacecraft (weight = zero).

Weight :
- It is the force by which a body is attracted to the earth.

Or
- It is the gravitational force (gravity) acting on a body's mass.

1. Properties of weight:

1. Weight is the force that always shows its effect towards the center of the earth.
2. There is no gravitational force in space, but on the earth the gravitational force attracts everything to the center of the earth.

G.R. Weight in space = zero

Because there is no gravitational force.

G.R. The weight of an object is not a fixed value (variable), but it differs from one place to another.

Because the gravitational force changes from one place to another.

2. Measurement unit of weight:

NOTE
1 Newton = 100 grams

- Weight is measured in a unit called Newton.
- A Newton is almost equal to the weight of an object whose mass is equal to 100 grams.

3. Measurement device of weight:

A spring scale is used for measuring weight. G.R.

▸ Because the spring scale measures the force of gravity pulling objects downwards.

- The extension of the spring scale (the distance that the spring goes down) is the weight of the body.



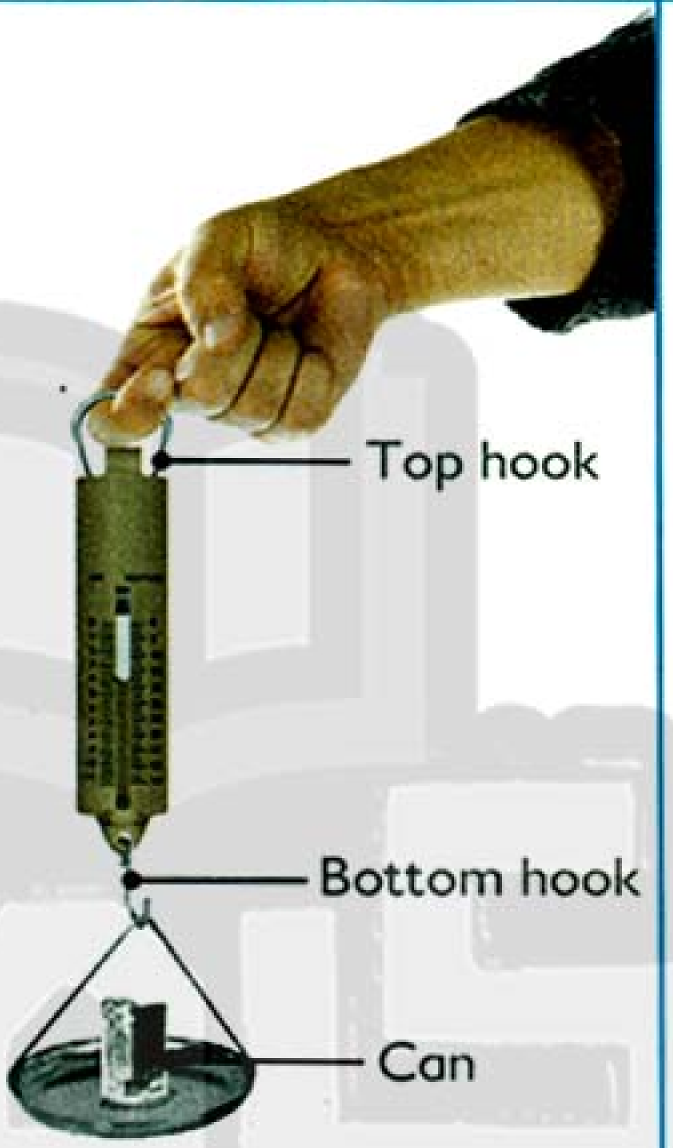
Structure of the spring scale

Lesson 1

Activity

To determine the weight of the objects by using a spring scale:

Materials: A spring scale - a can.

Steps	Illustration	Observation
1 Hold the spring scale from its top hook. 2 Hang the object (can) in the bottom hook. 3 Let the object go down slowly. 4 Record the reading which refers to the object's weight, when the object becomes stable.		The object (can) pulls the spring downwards and the reading of the pointer increases.

Conclusion

The weight of any object can be measured using a spring scale by determining the extension of the spring scale.

Enrichment information

Once upon a time, Isaac Newton was sitting under a tree, then he figured out why objects fall to the ground and he was inspired to think about the force that pulls all of the objects in the universe together and the reason why things don't float off into the sky, so he came up with the theory of **"GRAVITY"**.



4. Factors affecting the weight of an object:

1. The object's mass
2. The planet (place) where the object exists.
3. The distance between the object and the center of the planet.

1 The object's mass:

Activity To show the relation between mass and weight:

Materials: A balance scale - a spring scale - different objects with different masses.

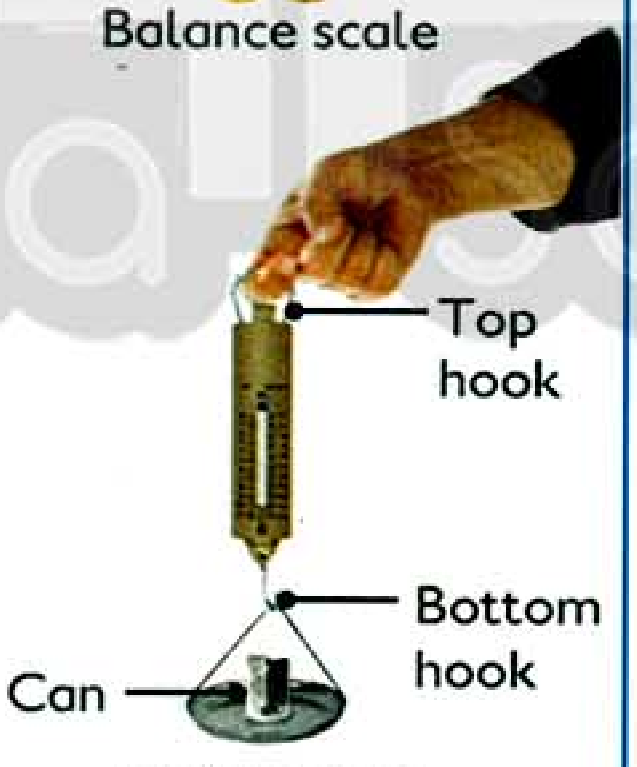
Steps

1. Find the mass of the first object by the balance scale.
2. Find the weight of the same object by the spring scale.
3. Repeat the previous steps using the other objects.
4. Record the results in a table.

Illustration



Balance scale



Spring scale

Observation

Mass (kg)	Weight (N)	Weight / Mass Ratio
1	10	....
2	20	....
3	30	....
4	40	....
5	50	....

- As the mass of the object increases, its weight increases.

Conclusion

- The weight of an object on the surface of the earth increases by increasing the mass of the object.
- The ratio of (weight / mass) is a constant value = 10, which is the earth's gravity.

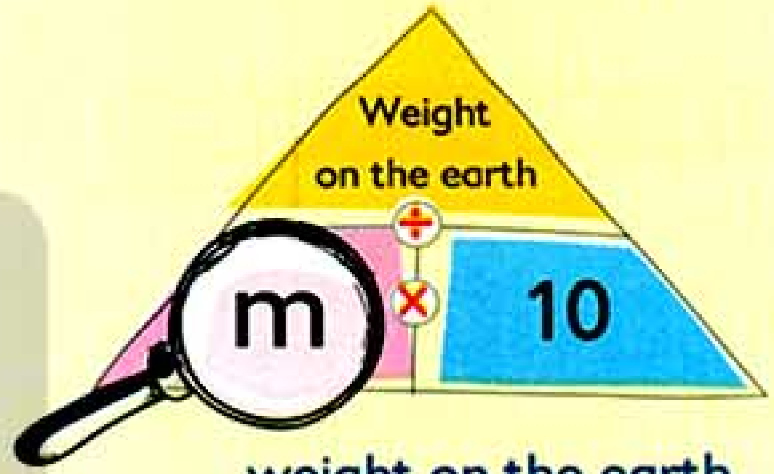
NOTE

- You can calculate the weight of an object on the earth's surface according to the following rule:

Object's weight on the earth = its mass (kg) × 10



Weight on the earth = mass (Kg) × 10



$$\text{Mass (Kg)} = \frac{\text{weight on the earth}}{10}$$

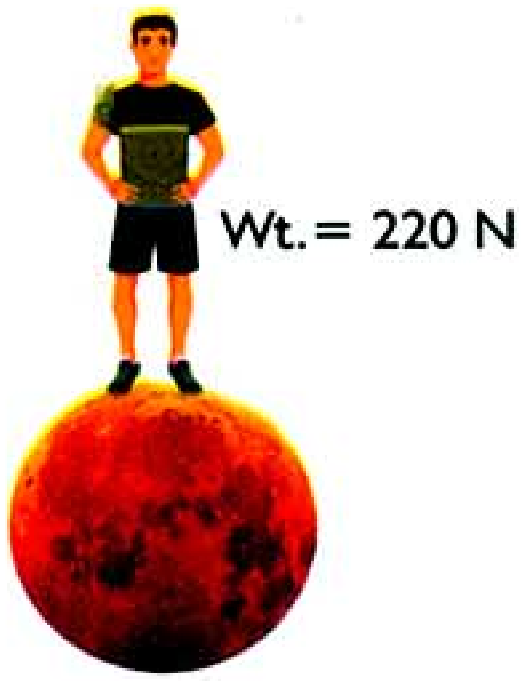
- The acceleration of gravity of the earth (a) = 10 m/s^2.
- The mass unit must be in (kg) when determining the weight.
- As mass increases, weight increases.

2 The planet (place) where the object exists:

- The weight of a body differs from one planet to another (or on the moon).
- As the mass of the planet increases, its gravitational force increases and the object's weight on its surface increases.



The Moon



Mars



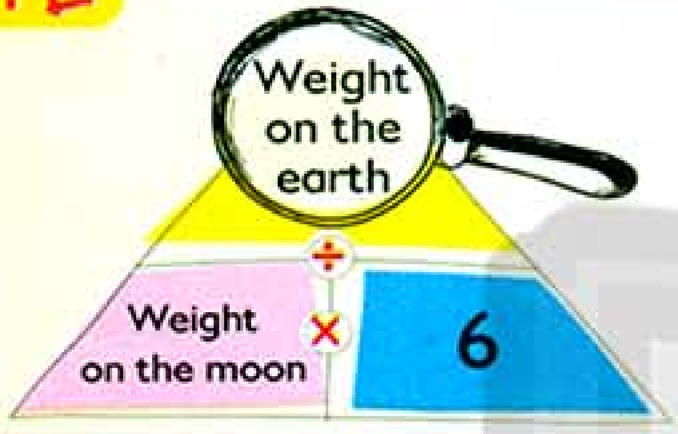
Earth

An object's weight on the earth differs from that on the moon.

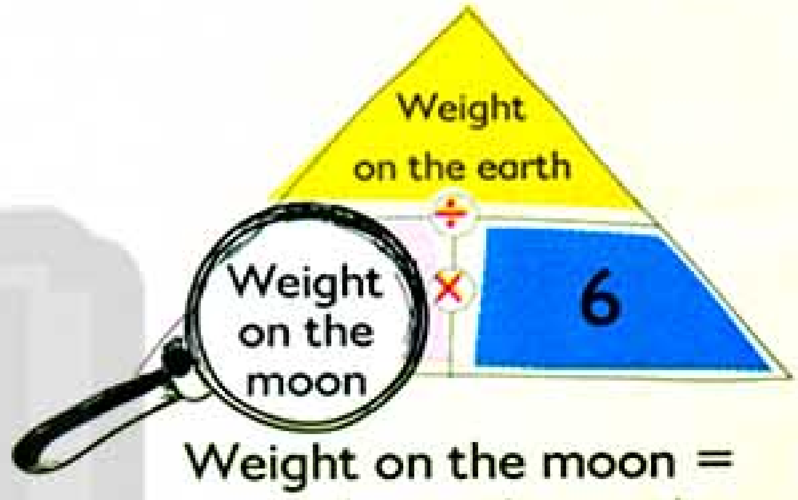
- The object's weight on the moon = $\frac{1}{6}$ (one sixth) of the object's weight on the earth.
- The weight on the earth is 6 times more than that in the moon. G.R.

  Because the earth's gravity is 6 times more than the moon's gravity.

NOTE



Weight on the earth = weight on the moon × 6

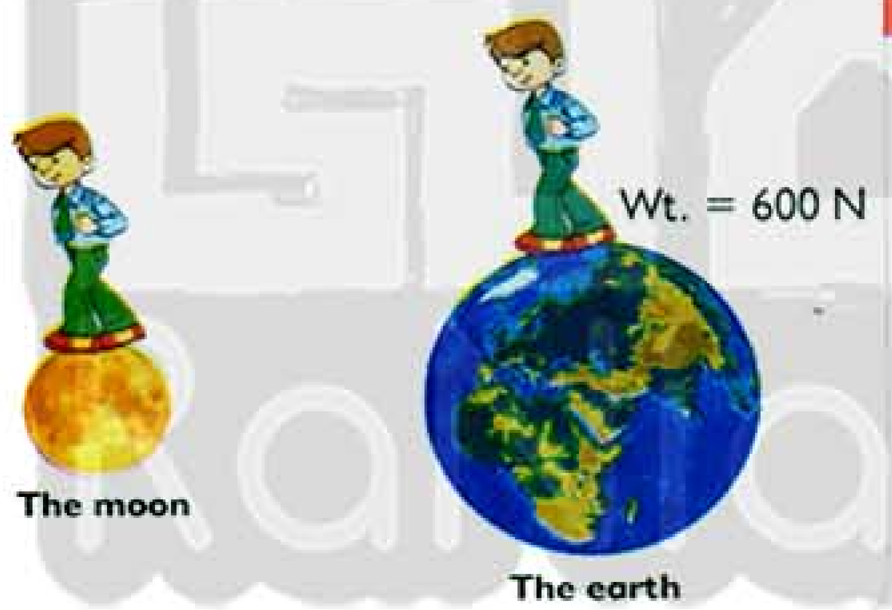


Weight on the moon = $\frac{\text{weight on the earth}}{6}$

Problems

1 **If your body's weight on the earth = 600 N, find your weight on the moon.**

Answer:



Weight on the earth = 600 N

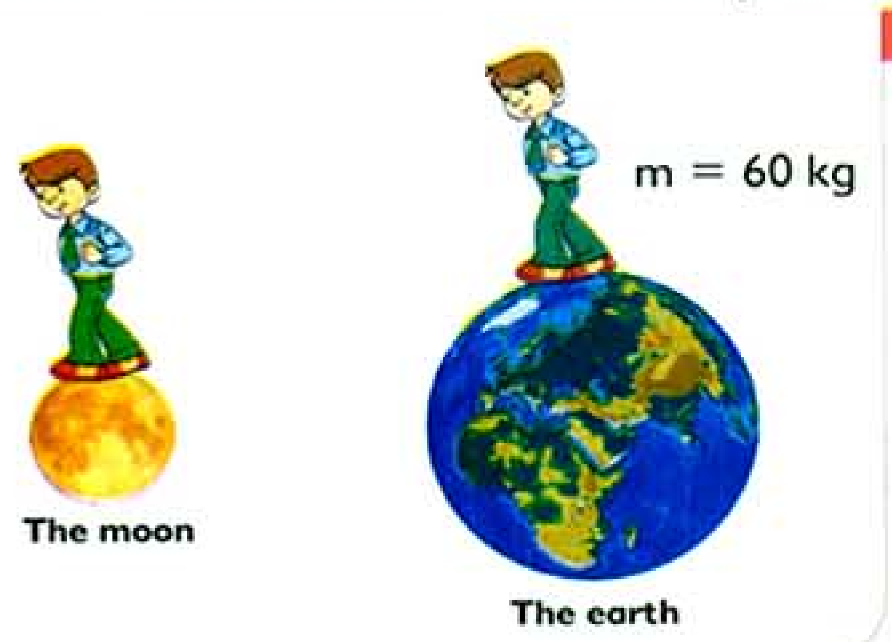
The body's weight on the moon

$= \frac{\text{weight on the earth}}{6}$

$= \frac{600}{6} = 100 \text{ N}$

2 **A person has a mass of 60 kg. How much does he weigh on the earth and how much would the same person weigh on the moon?**

Answer:



Mass = 60 kg

- Weight on the earth = mass × 10
- Weight = 60 kg × 10 = 600 N
- Weight on the moon = $\frac{\text{weight on the earth}}{6}$

  $= \frac{600}{6} = 100 \text{ N}$

3 The distance between the object and the center of the planet:

- **The weight of an object decreases, as the distance from the center of the planet increases.** G.R.

Because when the distance between the object and the center of the planet increases, the gravitational force decreases.

Example:

- The weight of a person in an elevator on the ground floor is heavier than his weight on the 6th floor which is lighter than his weight on the 5th floor.



G.R. The weight of a person in a flying balloon is lighter than his weight on the earth.

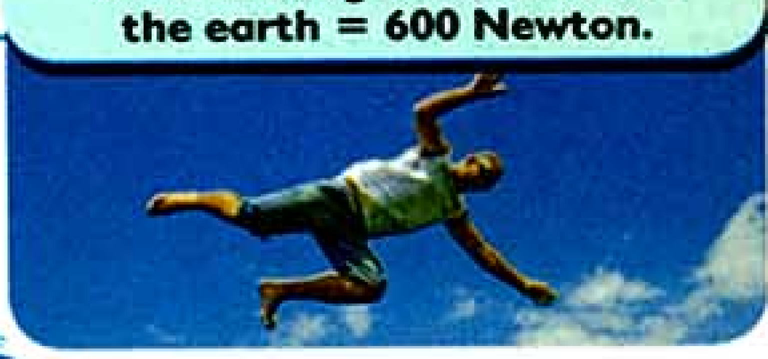
As the distance between the object and the center of the earth increases, the gravitational force decreases, so the weight decreases.

Comparison between mass and weight

Points of comparison	Mass	Weight
Definition	• The amount of matter in an object.	• The force by which the body is attracted to the earth.
Unit	• Gram - Kilogram - Ton	• Newton
Measurement devices	• Balance scale • Sensitive two-arm scale • One-arm digital scale • One-arm scale with a pointer	• Spring scale
Direction of its effect	• Has no effect on a certain direction.	• Its effect is towards the center of the planet.
Effects of changing places	• Constant (it does not change with the change in place).	• Variable (it changes from a planet to another or from a place to another).

What is meant by ...?

1 **The gravitational force by which a body is attracted to the earth = 600 Newton.**



It means that: the weight of the body on the earth = 600 Newton.

2 **The weight of a body on the earth = 700 Newton.**



It means that: the gravitational force which attracts the body to the earth = 700 Newton.

Check point 4 — Answer the following problems:

(Answer Guide: P. 2)

1. **If an object's weight on the earth is 600 N.**
   Calculate: 1. Mass on the earth. 2. Mass on the moon. 3. Weight on the moon.



1. Mass on the earth = ...
2. Mass on the moon = ...
3. Weight on the moon = ...

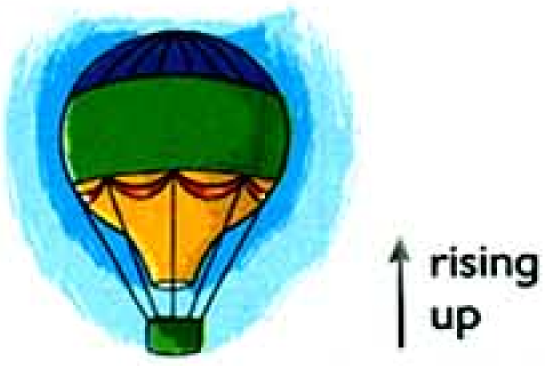
2. **If you know that the gravity on Mars is $\frac{1}{3}$ of the gravity on Earth, find the weight (on Mars) of a man whose mass is 70 kg (on Earth).**



....
....
....

TRY TO SOLVE
Worksheet 2 Page 5
Worksheet 3 Page 7

3. **If you put an object in a balloon when the balloon rises up, does the object's weight increase or decrease? Explain your answer.**



....
....
....



Lesson Overview

Summary

The difference between mass and weight

mass ≠ weight



1 Mass

It is the amount of matter in an object.

Measuring devices

- **One-arm scales.**
  - Digital scale
  - One-arm scale with a pointer
- **Two-arm scales.**
  - Balance scale.
  - Sensitive balance.

Measuring Units

- Gram (gm)
- Kilogram (Kg)
- Ton

2 Weight

It is the force by which a body is attracted to the earth.

Measuring device

- Spring scale

Measuring Unit

- Newton (N)

Factors affecting the weight of an object

1 The object's mass

- (As the mass of an object increases, its weight increases).

2 The planet (place) where the object exists

- (As the mass of the planet increases, the weight of the object increases).

3 The distance between the object and the center of the planet

- (As the distance between the object and the center of planet increases, the weight of the object decreases).

Now, I am able to:

- Define Mass and Weight.
- Name the measuring devices of mass and weight.
- Name the measuring units of mass and weight.
- Explain why mass is a fixed value while weight is a changeable value by changing the place.
- Mention the difference between mass and weight relative to the direction.
- Calculate the mass of objects on the earth and the weight of objects on the earth and the moon.

Language Focus

matter	المادة	object	شيء
mass	كتلة	digital scale	ميزان رقمي
sensitive scale	ميزان حساس	balance scale	ميزان ذو كفتين
standard masses	كتل قياسية	weight	الوزن
gravity	الجاذبية	weightlessness	انعدام الوزن
gravitational force	قوة الجاذبية	spring scale	ميزان زنبركى
constant	ثابتة	variable	متغير

References

Ministry of Education (MOE) Books

Egyptian Knowledge Bank

Al-Adwaa Application
- Al-Adwaa e-book
- Al-Adwaa Videos
- Al-Adwaa Question Bank

School Book Exercises

on Lesson 1

Answer Guide: P. 2

1 Complete the following sentences:

1. The measuring units of mass are .... or ...., whereas the measuring unit of weight is .... *(Beheira 2020)*
2. Mass is measured by .... whereas weight is measured by .... *(Cairo 2019)*
3. Mass is constant and is not affected by .... or .... *(Beheira 2020)*
4. An object's weight depends on .... and .... *(South Sinai 2019)*

2 Write the scientific term:

1. The amount of matter in an object. *(Cairo 2020)* (....................)
2. The force with which a body is attracted to the Earth. *(South Sinai 2018)* (....................)
3. The measurement unit of mass which is almost equal to the mass of a liter of distilled water. *(Cairo 2019)* (....................)
4. The measurement unit of weight which is almost equal to the mass of 100 grams. *(Giza 2020)* (....................)

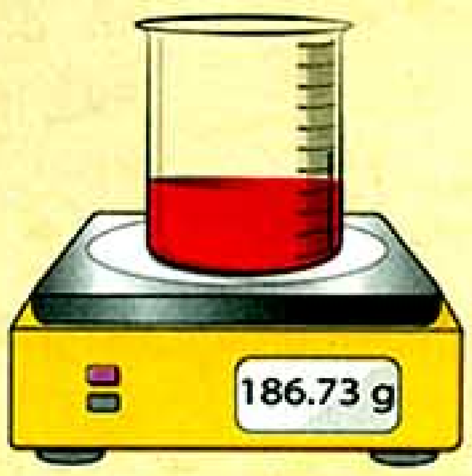
3 An object whose mass on the earth is 6 kg. Calculate its weight on both surfaces of the earth and the moon. *(Cairo 2019)*

....

....

4 The following pictures illustrate the steps of calculating a liquid mass using the digital scale. Look at the pictures and then calculate the mass and weight of this liquid.





....

....

5 Complete the following diagram:

Mass

1 …………	3 …………	5 …………	7 …………	9 …………
Definition	Units of measurement	Devices of measurement	Effect direction	Effects of changing places
2 …………	4 …………	6 …………	8 …………	10 …………

Weight

6 Match column (A) with the suitable in column (B):

(A)	(B)
1. The force with which a body is attracted to the Earth	a. Newton
2. The measuring unit of mass	b. Mass
3. The measuring unit of weight	c. Kg
4. The amount of matter in an object	d. Weight
	e. Spring scale

1. ………… 2. ………… 3. ………… 4. …………

Al-Adwaa Exercises on Lesson 1

Answer Guide: P. 3

Mass

1 Choose the correct answer:

1. The measuring unit of mass is .... *(Giza 2020)*
   a. Newton b. kilogram c. liter d. centimeter
2. .... equals the mass of one paper clip.
   a. Gram b. Newton c. Kilogram d. Liter
3. One of the tools that is used for measuring mass is the .... *(Cairo 2020)*
   a. kilogram b. balance scale c. Newton d. spring scale
4. All the following scales are examples of scales that are used to measure mass except the ....
   a. one-pan scale b. balance scale c. spring scale d. sensitive two-pan scale
5. The mass of half a liter of water equals .... *(Beheira 2018)*
   a. 5 g b. 50 g c. 5000 g d. 500 g
6. If the mass of a body on the moon's surface is 10 kg, then its mass on the earth's surface equals ....
   a. 10 kg b. 10 N c. 60 kg d. 60 N
7. The mass of the group of apples that is shown in the opposite figure is ....
   a. more than 2 kg b. less than 2 kg
   c. equals 2 kg d. no-correct answer



2 Complete the following sentences:

1. .... is the amount of matter in an object.
2. .... is the measuring unit of mass which is equal to the mass of one liter of distilled water.
3. Mass is measured by different types of scales such as .... and .... *(Kafr El-Sheikh 2013)*
4. The sensitive two-arm scale is used in measuring .... *(Qena 2014)*
5. The object's mass on the moon's surface is .... its mass on the earth's surface. *(Cairo 2013)*
6. The mass is constant and isn't affected by .... *(Giza 2019)*
7. The mass of an object .... when the amount of matter increases in it.
8. The mass of a group of tomatoes equals 5 ...., while the mass of a golden ring is 5 ....

3 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. Weight is the amount of material in a body. ( )
2. Mass is measured by a spring scale. *(Qalubia 2020)* ( )
3. The measuring unit of mass is Newton. *(Cairo 2020)* ( )
4. Kilogram nearly equals the mass of one paper clip. *(Giza 2019)* ( )
5. Sensitive two-arm scale is used to measure small masses as gold and cheese. *(Assiut 2018)* ( )
6. Weight is a constant amount that changes as the location changes. *(Cairo 2018)* ( )
7. The mass of one liter of distilled water equals 100 grams. ( )
8. Gram is suitable for measuring jewelry, while kilogram is suitable for measuring vegetables. ( )

4 Write the scientific term for each of the following:

1. The amount of matter in an object. *(Giza 2019)* (..................................)
2. The unit of measuring mass. *(Damietta 2018)* (..................................)
3. The measuring unit of mass which is suitable for measuring jewelry. *(Beheira 2013)* (..................................)
4. The device that is used to measure the mass of objects. *(Sohag 2014)* (..................................)
5. The device that is used to measure the mass of chemicals in the lab. (..................................)
6. The type of scales that is used to measure large masses such as cheese and fruits. (..................................)
7. The measuring unit of mass which equals the mass of one liter of distilled water. *(Cairo 2019)* (..................................)

5 Correct the underlined words:

1. Weight is the amount of matter in an object. (..................................)
2. Kilogram equals the mass of one paper clip. (..................................)
3. The spring scale is used for measuring mass. *(Beheira 2014)* (..................................)
4. Mass is measured in Newton which is equivalent to 1000 grams. *(Port Said 2014)* (..................................)
5. Weight is a constant amount that does not change as the location changes. *(South Sinai 2018)* (..................................)

Lesson 1

6. The mass of a piece of stone on the earth's surface is smaller than its mass on the moon's surface. (..............................)
7. Ton is suitable for measuring the mass of jewelry, while gram is suitable for measuring the mass of vegetables. (..............................)

6 Give a reason for each of the following:

1. The mass of a body on the earth's surface equals the mass of the same body on the moon's surface. *(Menofia 2013)*

   ....

2. The balance scale should be placed horizontally on a stable surface. *(Port Said 2013)*

   ....

7 What is the importance or the function of each of the following?

1. The balance scale. *(South Sinai 2019)*

   ....

2. The digital scale.

   ....

3. The sensitive scale. *(Gharbia 2018)*

   ....

8 Define:

Mass: ....

9 Problems:

The opposite pictures illustrate the steps of calculating the mass of a liquid using the digital scale.
Look at the opposite pictures, then calculate the mass of this liquid, then answer the following question.



....

....

What is the mass of the solid state of this liquid? And why?

....

Weight

1 Choose the correct answer:

1. .... is the gravitational force acting on a body's mass.
   a. Weight b. Mass c. Newton d. Kilogram
2. The measuring unit of weight is .... *(Giza 2020)*
   a. gram b. liter c. Newton d. kilogram
3. Newton equals the weight of an object whose mass equals .... *(Alex. 2020)*
   a. 100 grams b. liter c. 10 grams d. kilogram
4. .... is the device which is used for measuring weight. *(Cairo 2019)*
   a. One-arm scale b. Two-arm scale c. Digital scale d. Spring scale
5. The weight of an object on .... equals 6 times its weight on the moon's surface. *(Ismailia 2016)*
   a. Mars b. Earth c. Jupiter d. Neptune
6. The weight of any object .... by increasing its mass.
   a. remains constant b. decreases c. increases d. no correct answer
7. The weight of any object .... when the distance between the object and the center of the planet increases. *(Cairo 2020)*
   a. remains constant b. decreases
   c. increases d. no correct answer
8. The object which weighs 20 N on the earth, its mass equals .... *(Giza 2019)*
   a. 2 kg b. 10 kg c. 20 kg d. 200 kg
9. The weight of the body whose mass is 200 g on the earth's surface nearly equals .... *(Damietta 2018)*
   a. 2 N b. 20 N c. 200 N d. 2000 N
10. If the weight of a body is 2 Newton, then its mass is .... *(Cairo 2020)*
    a. 0.2 gm b. 20 gm c. 200 gm d. 2 gm
11. The weight of an object that is 40 kg equals .... *(Cairo 2019)*
    a. 40 N b. 400 N c. 4 N d. 4000 N
12. If your weight on the earth's surface is 600 N, then it is .... on the moon's surface. *(Giza 2018)*
    a. 6 N b. 60 N c. 100 N d. 10 N
13. If the mass of an object on the moon = 60 kg, so its weight on the earth = ... *(Dakahlia 2014)*
    a. 60 Kg b. 60 N c. 100 N d. 600 N

14. If your weight on the moon's surface is 50 N, then your weight on the earth's surface is .... N. *(Aswan 2014)*
a. 300 b. 50 c. 30 d. 500

15. If an object's mass on the earth's surface is 6 kg, then its weight on the moon's surface is .... *(Qalubia 2017)*
a. 6 kg b. 6 N c. 60 N d. 10 N

16. If the weight of a person in a balloon on a certain height from the earth's surface equals 70 N, then what is the weight of the person on the earth's surface? –.......... . *(Gharbia 2017)*
a. 68 N b. 69 N c. 70 N d. 71 N

17. A force of 1 N is approximately the force needed to lift ....
a. sugar cube b. a watermelon c. a car d. a mobile phone

2 Complete the following sentences:

1. The force of earth's attraction to a body is called .... and is measured in a unit which is called .... *(Ismailia 2020)*
2. The effect of weight is always directed towards the ....
3. The measurement unit of weight that is almost equal to the weight of an object whose mass is 100 g is called .... *(Cairo 2020)*
4. Mass is measured by .... scale, while weight is measured by .... scale. *(Cairo 2019)*
5. The weight of a wooden box on the earth's surface equals .... times its weight on the moon's surface.
6. An object's weight on the moon's surface equals .... its weight on the earth's surface. *(Suez 2014)*
7. The mass of a body on the earth is ...., whereas its weight on the earth is .... *(Cairo 2013)*
8. Objects seem weightless inside a spacecraft due to the absence of ....
9. Your weight changes depending on .... or .... *(South Sinai 2019)*
10. The weight of a body on the earth's surface increases as the .... increases. *(Menofia 2016)*
11. The attraction force between planets .... when their masses increase. *(Giza 2020)*
12. The weight of anybody .... when the distance between the body and the center of the planet .... as the gravitational force decreases. *(Gharbia 2019)*
13. If the weight of an iron ball is 200 N, then its mass equals.............................. .
14. When a mass of a desk is 15 kg, then its weight equals ....
15. The gravitational force on a balloon .... when the distance between the balloon and the center of the earth decreases. *(Gharbia 2018)*

3 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. Weight is the gravitational force with which a body is attracted to the earth. *(Dakahlia 2017)* (   )
2. Newton is the measurement unit of weight. *(Giza 2020)* (   )
3. The weight of objects can be measured by using the balance scale. *(Sohag 2018)* (   )
4. An object's weight on the moon is $\frac{1}{4}$ of its weight on the earth. *(Menofia 2013)* (   )
5. The effect of weight is always directed towards the surface of the earth. (   )
6. Gravity in space is zero, that's why astronauts are weightless. (   )
7. By increasing the mass of a piece of stone, its weight decreases. *(Red Sea 2012)* (   )
8. As the mass of a planet increases, the weight of a body on it decreases. *(Beni Suef 2012)* (   )
9. The Earth gravitational force increases as the body moves away from the Earth. (   )
10. When the mass of an object on the earth equals 2 kg, then its weight equals 200 N. *(Kafr El-Sheikh 2012)* (   )
11. When your weight on the earth's surface is 600 N, then your weight on the moon's surface is 6 N. *(Giza 2012)* (   )

4 Write the scientific term for each of the following:

1. The force by which a body is attracted to the Earth. *(Cairo 2019)* (..............................)
2. The device that is used to measure the weight of an object. *(Red Sea 2011)* (..............................)
3. The measurement unit of weight which is almost equal to a mass of 100 grams. *(Giza 2019)* (..............................)
4. Mass (kg) x 10. (..............................)
5. $\frac{\text{Weight}}{10}$. (..............................)

Lesson 1

5 Correct the underlined words:

1. Mass is the gravitational force with which a body is attracted to the earth. (..........)
2. Newton is the measurement unit of mass. (..........)
3. Gram equals the weight of an object whose mass is 100 grams. (..........)
4. The digital scale is used in measuring weight. *(Menofia 2016)* (..........)
5. The effect of weight is directed towards the upper atmosphere of the earth. (..........)
6. The reason that objects fall towards the earth is mass. (..........)
7. On the earth, there is weightlessness, but in space objects are weight. (..........)
8. The extension of the wire of the spring scale equals the mass of the object hung on it. (..........)
9. By increasing the mass of a piece of stone, its weight decreases. (..........)
10. Weight is inversely proportional to mass. (..........)
11. When the distance between an object and the center of its planet increases, its weight increases, as the gravitational force increases. (..........)
12. When the mass of a toy car equals 1 kilogram, then its weight equals 300 N. (..........)

6 Give a reason for each of the following:

1. Objects fall downwards in the earth. *(Beheira 2018)*
....
2. The weight on the earth is greater than the weight on the moon. *(Cairo 2019)*
....
3. The moon's gravity is less than the earth's gravity. *(Qalubia 2013)*
....
4. The weight of an object is affected by its mass.
....
5. The wire of the spring scale extends when a body is hung to it.
....
6. The weight of an object changes according to the planet that the object exists on it.
....
7. The weight of a body in a balloon is smaller than its weight on the earth. *(Sohag 2019)*
....

7 What happens if ...?

1. The mass of an object increases. *(Gharbia 2014)*
....
2. The mass of an object decreases to half.
....
3. There is no gravity on the earth's surface. *(Beheira 2014)*
....
4. The mass of the planet where the object exists increases.
....
5. The distance between a person in a balloon and the center of the earth increases. *(Ismailia 2019)*
....
6. A body moves away from the center of the earth according to its mass and weight. *(Beheira 2018)*
....

8 Choose from column (A) what is suitable for column (B): *(Minia 2014)*

(A)	(B)
1. The gravitational force acting on a body's mass.	a. kilogram.
2. The measurement unit of a light body's mass.	b. spring scale.
3. The measurement tool of weight.	c. weight.
4. The amount of materials in an object.	d. weight increases.
5. By increasing the mass of the planet.	e. gram.
6. The measurement unit of a heavy body's mass.	f. mass.

1. .... 2. .... 3. .... 4. .... 5. .... 6. ....

9 What is the importance or the function of each of the following?

1. The earth's gravity. *(Sharkia 2013)*
....
2. The spring scale. *(Cairo 2017)*
....

10 Define:

1. Weight : ....
2. Newton : ....

Lesson 1

11 **Compare between Mass and Weight:** *(Qalubia 2017)*

Points of comparison	Mass	Weight
1. Definition	....	....
2. Measurement unit	....	....
3. Measurement devices	....	....
4. Direction	....	....
5. Changing the place	....	....

12 **Use the given mass to calculate your weight on these celestial bodies, then answer the questions below:**

Celestial body	Your mass (kg)	Gravitational force	Your weight (N)
The earth	60	10	
The moon		1.6	
The sun		274	
Jupiter		25.9	

1. On which celestial body is your weight the heaviest?

....

2. On which celestial body is your weight the lightest?

....

13 **Mention the factors affecting weight.** *(Cairo 2019)*

....

....

....

14 **Mention the differences between the Balance scale and the Spring scale.**

....

....

....

15 **Draw an arrow to show the direction of a vase when it falls down.**



16 **Problems:**

1. If an object's mass on the earth = 30 kg *(Cairo 2019)*

   Calculate:

   a. Its mass on the moon.

   ....

   b. Its weight on the earth.

   ....

   c. Its weight on the moon.

   ....

2. An object whose weight is 30 Newton on the earth's surface. *(Cairo 2020)*

   Calculate:

   a. Its mass on the earth's surface.

   ....

   b. Its mass on the moon's surface.

   ....

   c. Its weight on the moon's surface.

   ....

3. Calculate the weight of a body if its mass on the earth is 3 kg.

   ....

   ....

4. Calculate the mass of a body if its weight is 200 N.

   ....

   ....

5. Calculate the weight of a body on the moon if its mass on the earth's surface is 60 kg. *(Giza 2014)*

   ....

   ....

Lesson 1

6. If the weight of a certain body on the earth's surface is 300 Newton, calculate:
   a. Its mass.
   ....
   b. Its weight on the moon's surface.
   ....

7. An object whose weight on the moon's surface is 100 Newton. Calculate:
   a. Its weight on the earth's surface.
   ....
   b. Its mass on the earth's surface.
   ....
   c. Its mass on the moon's surface.
   ....

8. Calculate the mass of a cat whose weight is 50 N. *(Beheira 2013)*
   ....
   ....

9. A piece of rock is placed in a pan of double-pan balance. If the sum of masses which are placed in the other pan to make balance is 300 gm. Answer the following:
   1. What is the mass of the piece of rock?
   ....
   ....
   2. What is the weight of the piece of rock?
   ....
   ....
   3. What is the effect of changing the place on both the mass and weight of the rock piece?
   ....
   ....

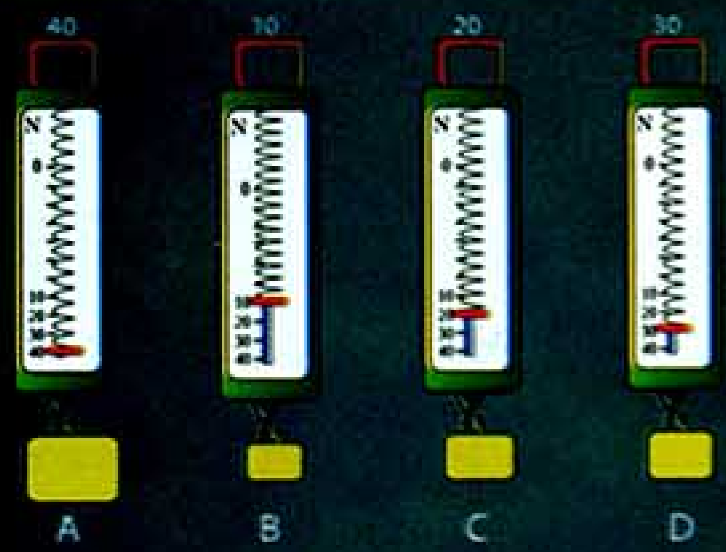
10. If you place a 75 N watermelon on a balance scale. What will be the reading of the scale? Do you think that the reading changes according to the location?
   ....
   ....
   ....

TIMSS Like Questions

on Lesson 1

Answer Guide: P.5

1. A class in grade 6 measured the weights of different objects with spring scale. Read and record the measurements on the spring scale below, then list the objects according to their weights. Start with the object that has the lowest weight.



....

....

....

2. A class in grade 6 measured mass and weight. Complete their table of results.
Remember to include the correct units for each measurement.

Object	Mass	Weight
Brick	2	....
Pile of books	....	25
Paper clips	1	....
Bag of cement	....	400

3. A student used the opposite instrument to measure the mass (m) of some objects, as shown in the figure.



a. Mention the name of this instrument.

....

b. What is meant by the reading of the instrument?

....

c. Write the mass of these paper clips on the moon.

....

4. A student used the opposite instrument in an experiment.



a. Mention the name of the instrument.

....

b. In which experiment can the student use this instrument?

....

c. What is the unit of the reading of this instrument?

....

5. Make a model of a balance scale.

Unit 1 Think & Create

Assignment No. (1)

- In space we feel weightless because there is no gravity. So we see the astronauts floating in their spacecrafts. Have you ever thought of the effect of zero gravity on the astronauts' health?
- Search the internet to know the effect of weightlessness on the astronauts' health.





Assignment No. (2)

- Do an interview with your school doctor about the dangers of obesity on human's health and write a report for this topic.

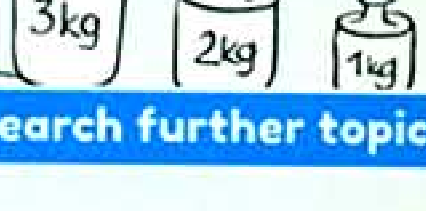


Assignment No. (3)

- Write an essay on the old and new measurement tools of mass and weight, showing the different types of these tools and the effect of scientific and technological progress on the accuracy of these tools.







Visit Egyptian Knowledge Bank to research further topics related to this Unit.

Unit 2

THERMAL ENERGY



Lesson 1 Heat Conduction

Objectives:

- Defining the concept of heat and temperature.
- Doing some experiments to identify heat conductors and heat insulators.
- Doing some experiments to show that different metals differ in conducting heat.
- Determining the uses of good and bad conductors of heat.

Lesson 2 Measuring Temperature

Objectives:

- Clarifying the idea of making the thermometer.
- Comparing between the medical and Celsius thermometers.
- Appreciating the importance of thermometers in our daily life.

LESSON 1 Heat Conduction

Brain Gym

- As you learned before the (The sun is the main source of heat energy).

On the basis of your previous knowledge of heat energy, tick the processes which use heat energy.

1. Melting of a piece of a butter. ( )
2. Operating the television. ( )
3. Burning a piece of wood. ( )
4. Lighting a lamp. ( )



What do you think is the common source of heat energy in your answers?

(....................................)

Heat energy

Importance (Uses) of heat

▸ Heat energy has many useful uses to us such as:



1 In our daily life (at home)

1. Cooking.
2. Water heating.
3. Warming the house.
4. Drying washed clothes.



2 In industry

1. Food industry.
2. Industry of paper, glass, textiles, etc.

1 Heat

It is a form of energy that transfers from an object of higher temperature to an object of lower temperature.

2 Temperature

It is the degree of hotness or coldness of an object.

Or

It is an indicator that expresses the state of a body as for hotness or coldness.

• Temperature is measured by special devices called thermometers.

Lesson 1

What happens if ... ?



1

- **You hold a glass of ice tea.**

You feel cold because heat transfers from your hand (the high temperature object) to the glass (the low temperature object) your hand loses its heat.



2

- **You hold a glass of hot tea.**

You feel hot because heat transfers from the glass (the high temperature object) to your hand (the low temperature object).

NOTE

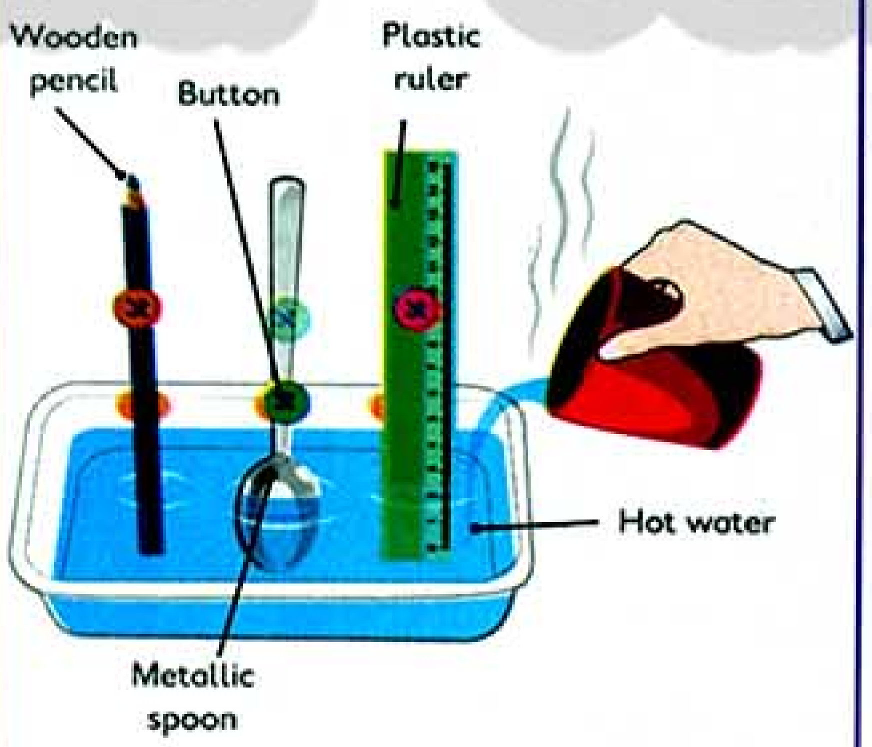
- Heat does not transfer between two objects that have the same temperature.

Materials and heat conduction

Activity

To show the ability of materials to conduct heat:

Materials: A glass container - a plastic ruler - a metallic spoon - a wooden pencil - molten wax - hot water - clay and three buttons.

Steps	Illustration	Observation
1. Fix the objects to the edge of the glass container and stick them using clay. 2. Stick the buttons on the ruler, spoon and pencil using the molten wax. 3. Pour hot water in the container, but not on its edges.		• The button falls from the metallic spoon. • The button neither falls from the plastic ruler nor the wooden pencil.

Conclusion

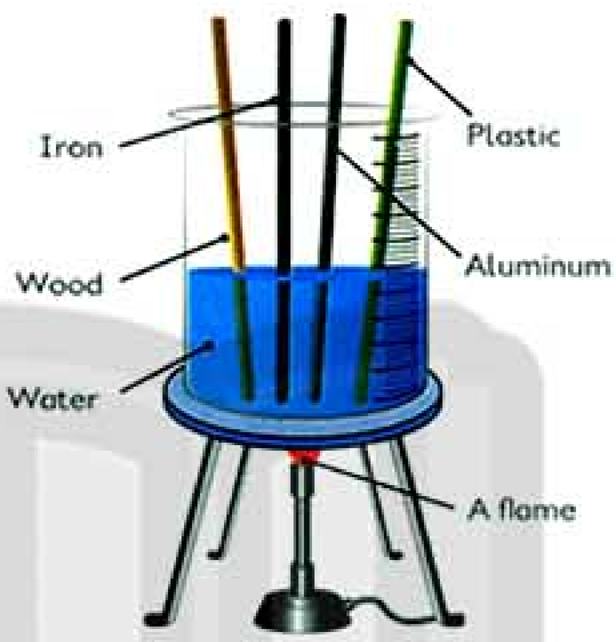
Materials are different in their ability to conduct heat.

Activity

To show that materials differ in conducting heat:

Materials: 4 identical rods in length and thickness made of different materials - a beaker containing water - a flame.

<table>
<tr><th>Steps</th><th>Illustration</th><th>Observation</th></tr>
<tr>
<td>1 Put the beaker containing water on the flame and leave the water to be heated.

2 Place the 4 rods inside the beaker and then touch the end of each rod with your finger.</td>
<td>
</td>
<td>• You feel hot on touching the aluminum and iron rods.
• You do not feel hot on touching the wooden and plastic rods.</td>
</tr>
</table>

Conclusion

Materials are different in their ability to conduct heat.

Heat conductors and heat insulators:

Materials are classified according to their ability to conduct heat into two types:

1 (Heat conductors) - good conductors of heat

They are the materials that allow heat to flow through.

Ex. Metals such as: iron – copper – aluminum – stainless steel.

2 (Heat insulators) bad conductors of heat

They are the materials that do not allow heat to flow through.

Ex. wood – plastic – glass – paper – wool – rubber – liquids – gases (air).

Check point 1 Write the scientific term for each of the following:

(Answer Guide: P. 6)

1. They are the materials that allow heat to flow through. *(Cairo 2019)* (..............................)
2. They are the materials that never allow heat to flow through. *(Giza 2019)* (..............................)



Lesson 1

Activity

To show that metals differ in their ability to conduct heat:

Materials: Two metallic racks – 3 metallic rods identical in length and thickness – aluminum and iron – molten wax – office pins – a flame – a stopwatch.

Steps	Illustration	Observation
1 Stick one pin at the end of each rod by wax. 2 Place the three rods on the two metallic racks as shown in the figure. 3 Using a stopwatch, calculate the time that each pin consumed to drop from each rod.		• The pin fixed on the copper rod falls first, then the pin fixed on the aluminum rod and finally the pin fixed on the iron rod.

Conclusion

Metals differ in their ability to conduct heat which means that some metals conduct heat faster than others:

Such as: Copper conducts heat faster than aluminum and iron.
Aluminum conducts heat faster than iron.

G.R.

1. **Iron is a good conductor of heat.**
   Because iron allows heat to flow through.
2. **Aluminum is faster than iron in conducting heat.**
   Because aluminum allows heat to flow through it faster than iron.

NOTE
All metals are good conductors of heat, but not all materials are good conductors of heat.

Check point 2

Rearrange these metals descendingly:

(Answer Guide: P. 6)

According to conductivity of heat: (aluminum - copper - iron)

1. .... 2. .... 3. ....



Uses of heat conductors and heat insulators

Heat conductors	Heat insulators	
• Aluminum, copper and stainless steel	• Plastic and wood	• Heavy blankets and woolen clothes
• Making of cooking pots (cooking utensils) and kettles.	• Making of handles of cooking pots, electric irons and kettles.	• They are used in winter.
G.R. Because aluminum is a good conductor of heat.	G.R. Because plastic and wood are heat insulators.	G.R. To keep bodies warm and prevent the leakage of heat.







G.R.

1. **Heat insulators are very important in our daily life.**
   Because they are used to make handles of cooking pots, kettles, heavy blankets and woolen clothes.
2. **Cooking pots are made of aluminum while their handles are made of plastic.**
   Because aluminum is a good conductor of heat while plastic is a bad conductor of heat.

Check point 3 **Choose the correct answer:** *(Answer Guide: P. 6)*

1. Woolen clothes are used in the winter because they are ....
   a. heat insulators　b. heat conductors
   c. heat energy　d. heat leakers
2. Cooking utensils are made of ....
   a. heat insulators　b. heat conductors
   c. heat protectors　d. heat preventers



Life applications on heat conductors and heat insulators

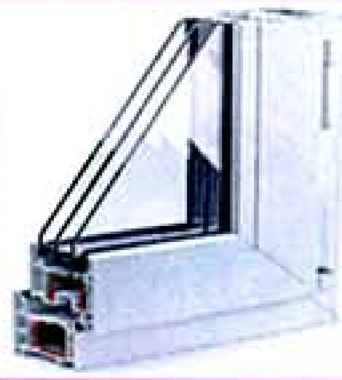
1 **On constructing the railways, gaps are left between the railway bars.** G.R.

To avoid train accidents as iron is a good conductor of heat which expands and twists by heat.



2 **Insulating glass windows are made by bonding two sheets of glass and maintaining a space between them filled with air.** G.R.

To prevent the leakage of heat as air is a bad conductor of heat.



Check point 4 **Choose the correct answer:** *(Answer Guide: P. 6)*

1. As a result of heat flow through metals, they ....
   a. expand b. contract
   c. get bigger d. (a) and (c)

2. Air is a ....
   a. heat conductor b. heat insulator
   c. (a) and (b) d. no correct answer



Benchmark

Selected from Previous Exams

(Answer Guide: P. 6)



1. Write the scientific term for each of the following:

1. Materials that do not let heat flow through. *(Cairo 2020)* (..............................)
2. The tool that is used to measure the temperature. *(Sharkia 2018)* (..............................)
3. The form of energy that transfers from an object of higher temperature to an object of lower temperature. *(Giza 2020)* (..............................)
4. The degree of hotness or coldness of a body. *(Cairo 2019)* (..............................)

2. What happens if ...?

- You touch a glass of hot water. *(Giza 2020)*

....

3. Compare between:

- The good conductors of heat and heat insulators (with respect to the definition). *(Giza 2018)*

P.O.C.	Good conductors of heat	Heat insulators
Definition	....	....

4. Correct the underlined words:

1. The measuring devices of temperature are <u>scales</u>. *(Cairo 2019)* (..............................)
2. Handles of cooking pots are made of <u>aluminum</u>. *(Cairo 2019)* (..............................)
3. Different metals transfer heat by the <u>same</u> rate. *(Gharbia 2015)* (..............................)

5. Give a reason for each of the following:

1. Cooking pots are made of aluminum, while their handles are made of plastic. *(Qalubia 2019)*

....
....

2. Air is used in making insulating glass windows. *(Cairo 2019)*

....
....

TRY TO SOLVE
Worksheet 4 Page 17
Worksheet 5 Page 19



Lesson Overview

Summary

1 Heat

- It is a form of energy that transfers from an object of higher temperature to an object of lower temperature.

2 Temperature

- It is the degree of hotness or coldness of an object.

Higher temperature object → Heat transfers → Lower temperature object

Heat conductors and insulators

P.O.C	Heat conductors	Heat Insulators
Definition	• They are the materials that allow heat to flow through.	• They are the materials that do not allow heat to flow through.
Uses	• They are used in making: a. Cooking pots. b. Kettles.	• They are used in making: 1. Handles of: a. Cooking pots. b. Iron. c. Kettles. 2. Heavy blankets and woolen clothes.
Examples	Copper – Aluminum – Iron	Plastic – Wood – Cork

- In cold countries, people benefit from air as an insulator material in keeping heat.
- In addition, air is used in making insulating glass windows.

Now, I am able to: ✓

- Define heat energy and temperature. ☐
- Name the measuring tool of temperature. ☐
- Differentiate between heat conductors and heat insulators. ☐
- Explain why cooking utensils are made of heat conductors. ☐
- Explain why heavy blankets help us to feel warm. ☐

Language Focus

expand	يتمدد
flow	يتدفق
food industry	صناعة الغذاء
heat conductors	مواد موصلة للحرارة
heat insulators	مواد عازلة للحرارة
leakage	تسرب
temperature	درجة الحرارة
textiles	منسوجات

References

Ministry of Education (MOE) Books

Egyptian Knowledge Bank

Al-Adwaa Application
- Al-Adwaa e-book
- Al-Adwaa Videos
- Al-Adwaa Question Bank

School Book Exercises

on Lesson 1

Answer Guide: P. 6

1 Complete the following sentences:

1. All metals are .... conductors of heat. *(Cairo 2019)*
2. .... conducts heat faster than aluminum. *(Dakahlia 2019)*
3. Some examples of good conductors of heat are .... and .... *(Sohag 2019)*
4. Some uses of good conductors of heat are ...., ... and .... *(Cairo 2020)*
5. Some examples of bad conductors of heat are .... , ... and .... *(Alex. 2014)*
6. Some uses of bad conductors of heat are ...., ... and .... *(Qalubia 2019)*

2 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. All materials are good conductors of heat. *(Giza 2020)* (   )
2. Wood is a good conductor of heat. *(Aswan 2014)* (   )
3. Cooking pots are made of plastic. *(Cairo 2019)* (   )
4. Handles of cooking pots are made of copper. *(Menofia 2012)* (   )
5. Aluminum is a bad conductor of heat. *(Qalubia 2013)* (   )

3 Provide the scientific term for each sentence:

1. Materials that allow heat to flow through.
(Cairo 2020) (..)
2. Materials that do not allow heat to flow through.
(Cairo 2020) (..)

4 Compare between ...:

– Heat conductors and heat insulators. *(Giza 2017)*

P.O.C.	Heat conductors	Heat insulators
Definition	....	....
Examples	....	....
Uses	....	....

Al-Adwaa Exercises on Lesson 1

Answer Guide: P. 6

Heat energy and its importance

1 Choose the correct answer:

1. The degree of hotness or coldness of a body is called .... *(Gharbia 2014)*
   a. heat b. temperature c. thermometer d. magnetism
2. Temperature is measured by using a device called .... *(Cairo 2020)*
   a. barometer b. thermometer c. voltmeter d. ammeter
3. Heat transfers from .... *(Ismailia 2012)*
   a. a hot object to a cold one b. a cold object to a hot one
   c. a heat conductor to a heat insulator d. a heat insulator to a heat conductor
4. When you touch a cup of hot tea, heat transfers from ....
   a. the hand to the cup b. the cup to the hand
   c. (a) and (b) d. otherwise
5. When you touch a cube of ice, heat transfers from .... *(Menofia 2012)*
   a. the hand to ice b. ice to the hand c. air to ice d. ice to air
6. The heat energy transfers from hot objects to the cold objects until ....
   a. one reaches zero temperature b. both have an equal temperature
   c. (a) and (b) d. no correct answer

2 Complete the following sentences:

1. Heat is one of the forms of .... *(Assuit 2017)*
2. Heat transfers from the .... object to the .... object. *(Giza 2019)*
3. .... is considered an indicator that helps us to express hotness or coldness of any body. *(Port Said 2014)*
4. We measure temperature by using ....
5. Heat is important for many industries such as .... and ....
6. .... and .... are examples of using heat in our daily life.

3 Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

1. Heat is a form of energy that transfers from cold object to hot object. *(Cairo 2019)* (   )
2. Heat is the degree of hotness or coldness of a body. (   )
3. Voltmeter is the device that is used in measuring the temperature of objects. (   )
4. Touching the objects only indicates that they are hot or cold. (   )

4 Write the scientific term for each of the following:

1. The form of energy that transfers from a hot body to a cold one. *(Qena 2017)* (..................)
2. A form of energy used in cooking and in warming water. (..................)
3. The indicator that helps us to express the state of a body as for hotness or coldness. *(Ismailia 2019)* (..................)
4. A device used in measuring temperature. *(Sohag 2018)* (..................)

5 Correct the underlined words:

1. Heat transfers from the objects of lower temperature to the objects of higher temperature. (..................)
2. Heat is an indicator that expresses the degree of hotness or coldness of an object. (..................)
3. For measuring the temperature of any object, we use a device which is called thermostat. (..................)
4. When you touch a piece of ice, heat transfers from ice to your hand. *(Menofia 2014)* (..................)

6 Give a reason for each of the following:

1. Heat is an important form of energy in our daily life.
   ....
2. Heat has great importance in industry.
   ....
3. On touching a cup of hot tea, you feel hot.
   ....
4. On touching a cube of ice, you feel cold.
   ....

7 What happens if ...?

1. You hold a glass of hot tea with your hand. *(Giza 2017)*
   ....
2. You hold a cube of ice with your hand. *(Damietta 2014)*
   ....
3. A hot object touches a cold one. *(Beheira 2014)*
   ....
4. Two bodies have the same temperature touch each other.
   ....

8 Define:

1. Heat. ....
2. Temperature. .... *(Qalubia 2012)*

9 What is the importance or the function of each of the following?

1. Heat energy. .... *(Qalubia 2016)*
2. Thermometer. ....

10 Choose from column (A) what suits in column (B): *(Dakahlia 2014)*

(A)	(B)
1. Heat	a. is an indicator that expresses the degree of hotness or coldness.
2. Thermometer	b. is a device used to measure temperature.
3. Temperature	c. is an important form of energy in our daily life.

1. .... 2. .... 3. ....

Heat conductors and heat insulators

1 Choose the correct answer:

1. Scientists classify the materials into ....
   a. heat insulators only b. heat conductors only
   c. heat conductors and heat insulators d. heat conductors and metals
2. Copper is a good conductor of heat because it ....
   a. allows heat to flow through b. does not allow heat to flow through
   c. is a heat insulator d. all the previous answers
3. Which of the following conducts heat faster? – .... *(Cairo 2019)*
   a. Iron b. Aluminum c. Copper d. Glass
4. All the following are substances which are good conductors of heat except .... *(Beni Suef 2018)*
   a. iron b. copper c. plastic d. aluminum

5. .... conducts heat faster than aluminum. *(Kafr El-Sheikh 2014)*
   a. Copper b. Iron c. Wood d. Plastic
6. Wool is considered ....
   a. a heat insulator b. a heat conductor
   c. a good conductor of heat d. (b) and (c)
7. Aluminum conducts heat faster than .... *(Beheira 2018)*
   a. copper b. iron c. glass d. (a) and (b)
8. .... material slows down the transfer of heat to houses in the summer.
   a. The insulator b. The conductor c. (a) and (b) d. No correct answer
9. .... material absorbs heat easily.
   a. The conductor b. The insulator c. (a) and (b) d. No correct answer

2 Complete the following sentences:

1. Materials that allow heat to flow through are called ....
2. Materials that do not allow heat to flow through are called ....
3. Copper conducts heat .... than aluminum. *(Cairo 2019)*
4. Metals differ in conducting heat, we find out that .... conducts heat faster than aluminum and ....
5. Materials are classified according to conducting heat into .... and .... *(Menofia 2017)*
6. Aluminum and copper are examples of .... conductors of heat. *(Giza 2019)*
7. Among the bad conductors of heat are .... , ... and .... *(Alex. 2014)*
8. .... is the best metal in conducting heat.

3 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. Copper is a good conductor of heat. ( )
2. Wool and plastic are examples of heat conductors. ( )
3. Air is a heat insulator. *(Cairo 2020)* ( )
4. Aluminum is faster in conducting heat than copper. *(Cairo 2019)* ( )
5. Heat conductors allow heat to flow through. ( )
6. Different metals transfer heat by the same rate. *(Port Said 2013)* ( )
7. Iron and wood allow heat to flow through. ( )

4 Write the scientific term for each of the following:

1. The materials that let heat flow through. *(Cairo 2019)* (.................................)
2. The materials that don't let heat flow through. *(Giza 2020)* (.................................)
3. A group of materials including copper, aluminum and iron. (.................................)
4. A group of materials including wool, wood and glass. (.................................)
5. The best metal in conducting heat. *(Giza 2019)* (.................................)

5 Correct the underlined words:

1. Air is a <u>good</u> conductor of heat. *(Ismailia 2016)* (.................................)
2. <u>Plastic</u> is a good conductor of heat. *(Sohag 2018)* (.................................)
3. Copper is a heat <u>insulator</u>. (.................................)
4. Different metals transfer heat with <u>the same rates</u>. *(Suez 2017)* (.................................)
5. Aluminum conducts heat faster than <u>copper</u>. *(Gharbia 2017)* (.................................)
6. <u>Iron</u> is the fastest metal in conducting heat. *(Sohag 2017)* (.................................)

6 Give a reason for each of the following:

1. Copper is a good conductor of heat.
....

2. Wool and plastic are heat insulators.
....

7 What happens if ...?

– You touch one end of an aluminum rod whose other end is placed in a beaker containing hot water.
....

8 Define:

1. Heat conductors. ....
2. Heat insulators. .... *(Alex. 2011)*

9 Cross out the odd word and then write the scientific term of the remaining words.

1. copper – wood – aluminum – iron – stainless steel
The odd word : ....
Scientific term : ....
2. plastic – wood – aluminum – glass
The odd word : ....
Scientific term : ....

10 Explain the following by carrying out an activity:

1. Materials are divided into good conductors of heat and bad conductors of heat.
2. Metals differ from each other in the speed of conducting heat.



11 Which rod will you use when you want to stir a hot liquid in your school lab without feeling the heat in your hand?
Give a reason for your answer.

....

....

Heat conductors and heat insulators (uses and life applications)

1 Choose the correct answer:

1. Heat conductors are used in ....
   a. making kettles b. making cooking pots
   c. making handles of kettles d. (a) and (b)
2. The insulating glass windows are made of .... *(Menofia 2016)*
   a. two adhesive sheets of glass
   b. two sheets of glass with space containing air in between
   c. a thin glass sheet d. a thin glass sheet containing water
3. To prevent the leakage of heat, insulating glass windows contain a layer of ....
   a. air b. water c. oil d. no correct answer
4. Woolen clothes and heavy blankets are used in winter to keep ....
   a. body warm b. weather warm c. body cold d. weather cold
5. Cooking pots are made of ....
   a. plastic b. wood c. aluminum d. rubber
6. Cooking utensils are provided with handles of .... *(Dakahlia 2019)*
   a. copper b. wood c. iron d. aluminum
7. If you can't open a lid of a jar made of a metal.
   Choose from the following the easiest way to help you? ....
   a. Place the lid under the cold water to contract & ease its opening
   b. Place the lid under the hot water to expand & ease its opening
   c. Place the lid under the hot water to contract & ease its opening
   d. No correct answer



2 Complete the following sentences:

1. In the insulating glass window, a space filled with .... is left between two glass sheets.
2. In the insulating glass window, the layer of air prevents the leakage of ....
3. To avoid train accidents, ... are left between the railway bars.
4. Cooking pots are made of ...., while handles of cooking pots are made of .... *(Sharkia 2013)*

3 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. Metals are used in making of cooking pots. ( )
2. Cooking pots and kettles are made of plastic. *(Giza 2019)* ( )
3. Wool and heavy blankets are used to keep the body warm because they are heat conductors. ( )
4. Insulating glass windows contain a layer of air to allow the leakage of heat. ( )
5. Gaps are left between the railway bars to avoid train accidents. ( )

4 Write the scientific term for each of the following:

1. The materials that are used in making of cooking pots and kettles. (..............................)
2. The materials that are used in making of handles of cooking pots and kettles. (..............................)
3. An insulating material which is left between the two glass sheets of the insulating glass windows. (..............................)
4. The type of clothes that is used in winter to keep our bodies' temperature. *(Menofia 2016)* (..............................)

5 Correct the underlined words:

1. Handles of cooking pots are made of <u>steel</u>. *(Cairo 2014)* (..............................)
2. Cooking pots are made of <u>plastic or wood</u>. (..............................)
3. <u>Iron</u> is used to make the iron handles. *(Menofia 2016)* (..............................)

6 Give a reason for each of the following:

1. Cooking pots are made of aluminum or stainless steel. *(Port Said 2019)*
....
2. Plastic is used to make handles of cooking pots. *(Beheira 2018)*
....
3. Aluminum is used in the manufacturing of kettles. *(Assuit 2017)*
....
4. Heat conductors have great importance in our daily life.
....

5. Heat insulators are very important in our life.
....
6. It is important to wear heavy woolen clothes in winter. *(Dakahlia 2014)*
....
7. Air is used in making insulating glass windows. *(Cairo 2019)*
....
8. Gaps are left between the railway bars. *(Qalubia 2016)*
....

7 What happens if ...?

1. All substances that man uses are good conductors of heat. *(South Sinai 2018)*
....
2. Handles of cooking pots are made of aluminum. *(Qalubia 2019)*
....
3. No gaps are left between railway bars. *(Menofia 2017)*
....

8 What is the importance or the function of each of the following?

1. Good conductors of heat. ....
2. Bad conductors of heat. .... *(Aswan 2016)*
3. Stainless steel and aluminum. .... *(Dakahlia 2016)*
4. Wood and plastic. ....
5. Heavy blankets and woolen clothes in winter.
....
6. Plastic in the manufacturing of handles of cooking pots (utensils).
....

9 Choose from column (A) what is suitable for column (B): *(Dakahlia 2014)*

(A)	(B)
1. Aluminum	a. is used in making of handles of kettles.
2. Plastic	b. is used in making of cooking pots.
3. Wool	c. keeps the body warm in winter.

1. .... 2. .... 3. ....

10 Compare between ...:

- Aluminum and wood.

Points of comparison	Aluminum	Wood
1. The ability to conduct heat	....	....
2. Uses	....	....

TIMSS Like Questions

on Lesson 1

Answer Guide: P.8

1. Explain why small gaps are left between railway bars.



....

....

....

2. Which button will fall first?

Check on the box:

a. ☐ The button on the ruler.

b. ☐ The button on the pencil.

c. ☐ The button on the spoon.



Explain your answer.

....

3. Write True or False next to the following statements:

a. Aluminum conducts heat faster than copper. (..............)

b. Heavy blankets are considered heat insulators. (..............)

c. Wood, plastic, glass and rubber are bad conductors of heat. (..............)

d. Handles of cooking pots and kettles are made of plastic. (..............)

4. Carry out the following activity, then answer the following question:

Which hand feels heat? Why?



....

....

5. Some animals in cold weather can keep their bodies warm. Write a research about the natural insulating materials of animals.

....

LESSON 2 Measuring Temperature

Brain Gym

What is the better way to know the temperature of a sick person, by touching them or using thermometers? (Tick ✓ under the correct photo):





- The sense of touching tells us if the body is hot or cold , but the accurate method to measure temperature is using thermometers.

Importance of measuring temperature:

1



It helps us to know our bodies' temperature to check our health condition.

2



It helps us to know the weather temperature which affects our life activities.

3



It is useful to some food industries that require a certain temperature.

■ **Thermometer :** It is the device which is used to measure temperature.

Check point 1

A) Complete the following sentences: *(Answer Guide: P. 8)*

- Temperature is measured by a device that is called ....

B) Answer the following questions:

1. Can we depend on touching to determine the temperature of the body? Explain your answer.

   ....

2. What is the importance of measuring temperature?

   ....

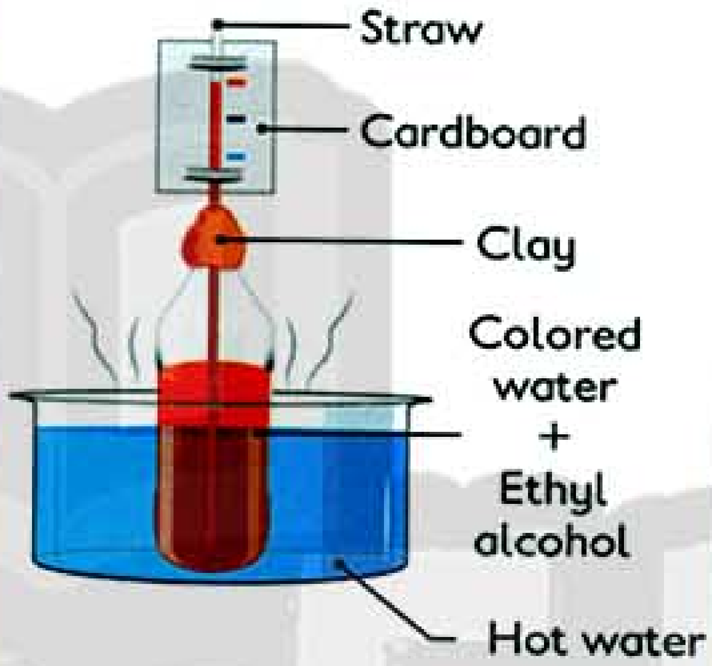
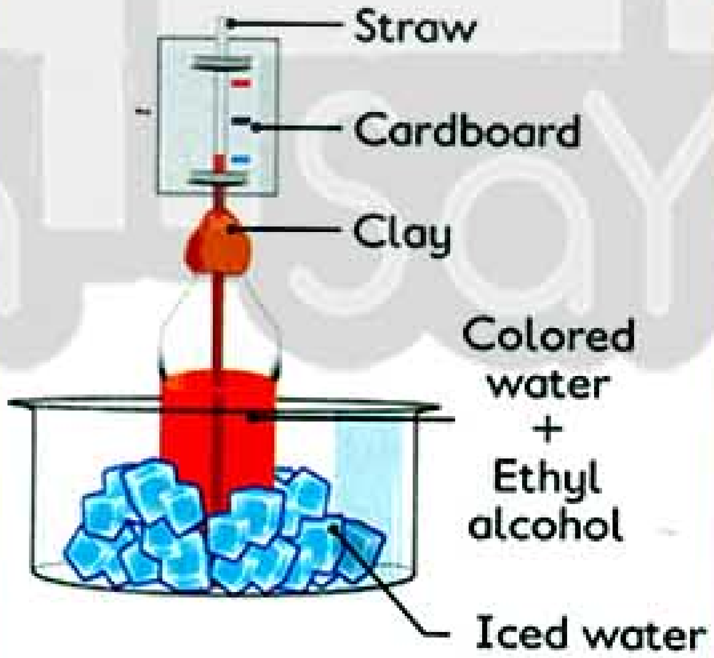


Lesson 2

The idea of making the thermometer:

Activity **To identify how the thermometer works:**

Material: Water - ethyl alcohol - a plastic bottle - red color - a straw - clay - a beaker with hot water - a beaker with iced water - cardboard - a coloring crayon.

Steps	Illustration	Observation
1 Fill half of the plastic bottle with equal quantities of ethyl alcohol and water. 2 Add some drops of red color and stir them. 3 Put the straw in the bottle without touching the bottom of the bottle. 4 Use the clay to fix the straw and close the mouth of the bottle. 5 Make two cracks in a piece of cardboard, and then fix the straw through the two cracks. 6 Mark the liquid level using a coloring crayon.		The liquid level increases in case of hot water and decreases in case of cold water.
7 Put the bottle in the beaker containing hot water and notice what will happen to the liquid inside the straw. 8 Mark the liquid level using a second coloring crayon. 9 Transfer the bottle to the beaker containing iced water and notice what will happen to the liquid inside the straw. 10 Mark the liquid level using a third coloring crayon.		

Conclusion

- Liquids expand by heating and contract by cooling.
- The idea of making of the thermometer is the change in the volume of liquids as the temperature changes.

Types of thermometers:

There are many types of thermometers such as:

A) The medical (clinical) thermometer

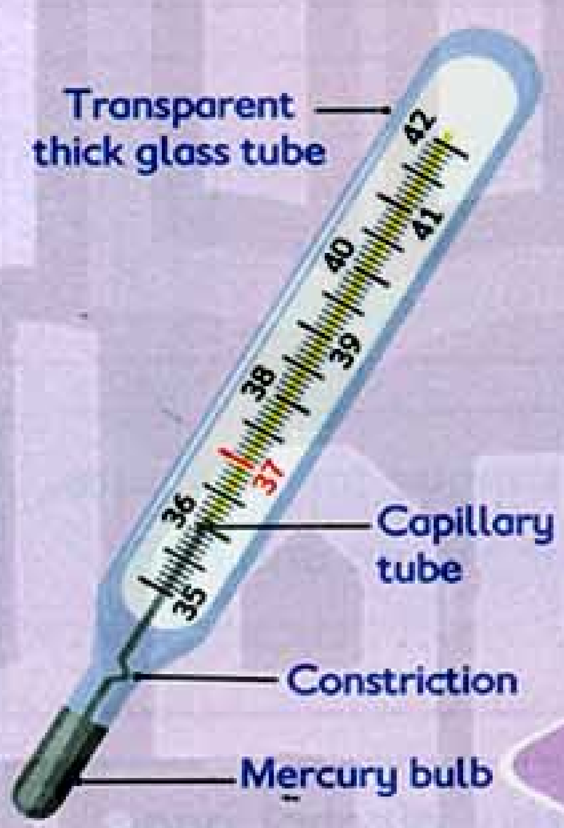
B) The Celsius thermometer

A The medical (clinical) thermometer

Structure:

It consists of:

1. A transparent thick glass tube.
2. A capillary tube closed from one of its ends.
3. A constriction in the capillary tube above the mercury bulb.
4. A bulb filled with mercury connected to the other end of the capillary tube.



Uses:

- It is used in measuring the temperature of the human body.

Scale:

- The scale of this thermometer starts from 35°C to 42°C.
- Each degree is divided into 10 parts, where each part equals $\frac{1}{10}$ of a degree.

G.R. There is a constriction above the mercury bulb.

To prevent mercury from going back to the bulb quickly in order to read the temperature easily.

Technological application

- Digital thermometers are modern types of thermometers which display the body temperature digitally (in digits).
- This type of thermometers is used especially for children.





Using the medical thermometer

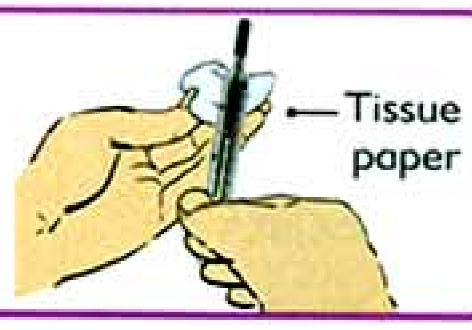
▸ To measure your body's temperature, do the following steps:

1 **Sterilize the medical thermometer by using ethyl alcohol.** G.R.

To kill microbes.



2 Dry the thermometer very well using tissue paper.



3 **Shake the thermometer well.** G.R.

To force the mercury to go back to the bulb.



4 **Put the thermometer under your tongue for a minute.**
Get the thermometer out from your mouth and then record the reading on it.



5 Sterilize the thermometer using ethyl alcohol again and put it in its box.



NOTE

The normal temperature of the human body is 37°C.

Caution!

1. **Do not seize the thermometer firmly with your teeth.** G.R.
   - In order not to break it as mercury is toxic.
2. **The medical thermometer must be kept out of children's reach.** G.R.
   - Because mercury is toxic.

TRY TO SOLVE
Worksheet 6
Page 21

B The Celsius thermometer

Structure:

1. A transparent thick glass tube.
2. A capillary tube closed from one of its ends.
3. A bulb filled with mercury connected to the other end of the capillary tube.



Uses:

- It is used in measuring the temperature of liquids or weather.

Scale:

The scale of this thermometer starts from 0°C to 100°C.

Each degree is divided into 10 parts, where each part equals 1 degree.

There is no constriction above the mercury bulb.

Scientists helped humanity

- The Swedish scientist Anders Celsius created the Celsius scale in 1742.
- He considered the zero°C (the lower fixed point) as the melting point of ice (the freezing point of water) and 100°C (the upper fixed point) as the boiling point of water.
- He divided the distance into 100 parts from zero to 100, where each part is equal to one degree.



Lesson 2

Activity

To show how to use the Celsius thermometer in measuring the temperature of liquids:

Material: The Celsius thermometer – a glass containing warm water – a glass of cold soft drink – a cup of hot tea.

Steps	Illustration	Observation
1 Put the Celsius thermometer in the glass of warm water. Wait until mercury rises and stops and record the temperature of hot water.	 Warm water	The mercury level stops at 40°C. (warm water)
2 Repeat the previous step by using a glass of cold soft drink.	 Cold drink	The mercury level stops at 5°C. (cold drink)
3 Repeat the previous steps by using a cup of hot tea and record the temperature of each.	 Hot tea	The mercury level stops at 80°C. (hot tea)

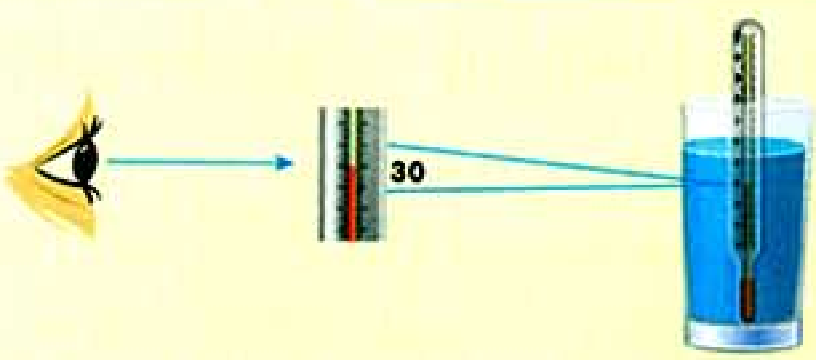
Conclusion

- The Celsius thermometer is used in measuring the temperature of different liquids.
- The reading of the Celsius thermometer differs according to the degree of hotness or coldness of the tested liquid.

NOTE

During recording the temperature:

- The thermometer must be vertical.
- The direction of sight must be perpendicular to the thermometer.



Why is mercury preferred in making thermometers?

Mercury is used in making thermometers. G.R.

Because:

1. It is a liquid metal that can be seen easily through the capillary tube.
2. It is a good conductor of heat.
3. It expands regularly to give an accurate measurement.
4. It does not stick to the walls of the capillary tube.
5. It remains liquid between (-39°C) and (357°C), so it gives a wide range for measuring temperature.

Enrichment information

- Some thermometers contain two scales: one represents the Celsius scale (°C) and the other represents the Fahrenheit scale (°F).
- 0°C = 32°F and 100°C = 212°F
- The scale of some types of Celsius thermometers starts from 0°C to 200°C.



Check point 2

Complete the following sentences: (Answer Guide: P. 8)

1. The .... thermometer is used to measure human body temperature, while .... thermometer is used to measure liquids temperature.

2. The scale of medical thermometer starts from .... (°C) to .... (°C), while the scale of Celsius thermometer starts from .... (°C) to .... (°C).



Lesson 2

Comparison between the medical thermometer and the Celsius thermometer:

Points of comparison	The medical thermometer	The Celsius thermometer
Range of scale	• From 35°C to 42°C	• From 0°C to 100°C
Constriction	• Present	• Absent
Used liquid	• Mercury	• Mercury
Usage	• It is used to measure the temperature of the human body.	• It is used to measure the temperature of liquids.
Structure	a. A transparent thick glass tube. b. A capillary tube closed from one of its ends. c. A mercury bulb that is filled with mercury and connected to the other end of the capillary tube.	

Benchmark

Selected from Previous Exams

(Answer Guide: P. 8)



1. Complete the following sentences:

1. The way the thermometer works with is the change of the .... of the liquid inside as the .... changes. *(Fayoum 2016)*
2. There is a constriction in the .... thermometer. *(Port Said 2019)*
3. The scale of the clinical thermometer starts from .... and ends with .... *(Ismailia 2019)*
4. We use .... to measure the boiling point of water, while .... is used to measure the temperature of the patient. *(Damietta 2019)*
5. The Celsius thermometer is used in measuring .... *(Cairo2020)*
6. The freezing point of water is .... , while the boiling point of water is .... *(Cairo 2019)*

2. Give a reason for each of the following:

- The medical thermometer has a constriction. *(Cairo 2020)*

....

3. Write the scientific term for each of the following:

1. The liquid which is used in manufacturing of thermometers. *(Cairo 2019)* (....................)
2. The modern device which is used to measure the temperature of the human body especially children. *(Giza 2016)* (....................)
3. The device that is used to measure the temperature of liquids. *(Giza 2020)* (....................)

4. Mention the measurement unit of the following:

- Temperature. *(Cairo 2018)*

....

5. Put (✓) or (✗):

1. The Celsius thermometer is used for measuring temperature of the human body. *(Cairo 2020)* (   )
2. Mercury gives a wide range for temperature measurement. *(Cairo 2019)* (   )

TRY TO SOLVE
Worksheet 7
Page 23

Lesson Overview

Summary

Thermometer: It is the device that is used to measure temperature.

The main idea of making of thermometers is changing the volume of liquids by changing temperature, where liquids expand by heating and contract by cooling.

Types of thermometers

Medical thermometer
It measures human body temperature.

Celsius thermometer
It measures liquids temperature.

Mercury is used in making of thermometers because:

Mercury

1. It is a good conductor of heat.
2. It is a liquid metal that can be seen clearly.
3. It expands regularly to give an accurate measurement.
4. It doesn't stick to the wall of the capillary tube.
5. It remains liquid between (-39°c) and (357°C).

Now, I am able to:

- Name the two types of thermometers and their components. ☐
- Use the medical thermometer to measure the temperature of a sick person. ☐
- Use the Celsius thermometer to measure the temperature of any liquid. ☐
- Mention the mercury properties. ☐

Language Focus

medical thermometer	ترمومتر طبى
Celsius thermometer	ترمومتر سيليزى
expand	يتمدد
contract	ينكمش
sterilize	يعقم
seize	يضغط / يمسك بقوة
toxic	سام
wide range	نطاق واسع

References

Ministry of Education (MOE) Books

Egyptian Knowledge Bank

Al-Adwaa Application
- Al-Adwaa e-book
- Al-Adwaa Videos
- Al-Adwaa Question Bank



School Book Exercises on Lesson 2

Answer Guide: P. 9

1 Complete the following sentences:

1. The scale of the medical thermometer starts from .... and ends with .... *(Port Said 2019)*
2. There is a constriction in the .... thermometer. *(Cairo 2019)*
3. The kinds of thermometers are .... and .... *(Beni Suef 2014)*
4. The Celsius thermometer is used in ...., whereas the medical thermometer is used in ....
5. The thermometer is ....
6. The water freezes at .... and boils at ....

2 Put (✓) in front of the right statement and (✗) in front of the false one and correct the false ones:

1. The Celsius thermometer is used for measuring the temperature of the human body. *(Ismailia 2017)* (   )
2. The scale of the medical thermometer starts from zero until 100 Celsius degrees. *(Qena 2014)* (   )
3. The medical thermometer is used for measuring the temperature of liquids. *(Sohag 2018)* (   )
4. There is a constriction above the bulb in the Celsius thermometer. *(Cairo 2019)* (   )
5. The liquid which is used in the medical thermometer is water. *(Cairo 2013)* (   )

3 Write the scientific term:

1. The device which is used to measure the temperature of liquids. *(Beheira 2018)* (....................)
2. The device which is used to measure the temperature of the human body. *(Cairo 2019)* (....................)
3. The liquid that is used in making thermometers. *(Giza 2019)* (....................)

4 Compare between the medical and the Celsius thermometers in structure and usage.

....

....

....

5 Write a paragraph on your own on each of the following concepts:

Instruments used in measuring the temperature

- The medical thermometer
- The Celsius thermometer

Al-Adwaa Exercises on Lesson 2

Answer Guide: P. 9

Medical thermometer

1 Choose the correct answer:

1. The device that is used for measuring temperature is the ....
   a. barometer   b. thermometer   c. voltmeter   d. spring scale

2. Making of the thermometer depends on the idea of .... *(Cairo 2018)*
   a. the change of gas volume with the change in temperature
   b. the change of liquid volume with the change in temperature
   c. the change of gas mass with the change in temperature
   d. the change of liquid mass with the change in temperature

3. The temperature of the human body is measured by the ....
   a. Celsius thermometer   b. clinical thermometer
   c. thermostat   d. (a) and (b)

4. The bulb of the medical thermometer is filled with ....
   a. alcohol   b. water   c. mercury   d. air

5. The minimum and maximum graduation of the medical thermometer is between .... °C.
   a. 32° and 45   b. 0° and 100   c. 35° and 42   d. 37° and 44

6. Each degree in the medical thermometer is divided into .... parts.
   a. 3   b. 5   c. 6   d. 10

7. The constriction above the mercury bulb in the medical thermometer serves in .... *(Cairo 2011)*
   a. preventing mercury from going back to the bulb easily
   b. forcing mercury to return to the bulb
   c. sterilizing the thermometer
   d. clearing the temperature reading

8. Before using the clinical thermometer, we must sterilize it to ....
   a. warm the mercury   b. prevent mercury from returning easily
   c. force the mercury to go back to the bulb   d. kill microbes

Lesson 2

9. Before using the medical thermometer, we shake it to ....
   a. sterilize it b. clean it from dust
   c. force mercury to go back to the bulb d. (a) and (b)

10. When the temperature of mercury increases, its .... regularly. *(Gharbia 2018)*
   a. volume decreases b. mass increases
   c. volume increases d. (b) and (c)

11. The following are types of thermometers except .... thermometer.
   a. clinical b. digital c. mercury d. computerized

2 Complete the following sentences:

1. Temperature is measured by using ....
2. Types of thermometers are .... and .... *(Sohag 2019)*
3. The thermometer is ....
4. To measure the temperature of the human body, we use .... *(Beheira 2017)*
5. The main idea of making the thermometer is changing the .... of the liquid as the .... changes. *(Fayoum 2016)*
6. The medical thermometer is characterized by the presence of a .... above the mercury bulb.
7. In the medical thermometer, the .... prevents mercury from going back to the bulb quickly.
8. Each degree in the scale of the medical thermometer is divided into .... parts. *(Cairo 2019)*
9. The graduation of the medical thermometer starts from .... to .... *(South Sinai 2019)*
10. Before using the medical thermometer, we must .... it well to force the mercury to go back to the bulb.
11. Before using the medical thermometer, we must .... it to kill microbes.

3 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. The main idea of making thermometers is the change in the volume of liquids according to the change in temperature. *(Kafr El-Sheikh 2013)* (   )
2. Temperature is measured by using the thermostat. (   )
3. The liquid which is used in the medical thermometer is mercury. *(Qena 2014)* (   )

4. The medical thermometer is graduated from 35°C to 45°C. *(Giza 2019)* (   )
5. The temperature of the healthy human body is 35°C. *(Cairo 2019)* (   )
6. Each degree in the scale of the medical thermometer is divided into 10 parts. (   )
7. The medical thermometer and the Celsius thermometer are among the types of thermometers. *(Sharkia 2011)* (   )
8. Before using the medical thermometer, we must sterilize it using water. (   )
9. We cannot depend on the sense of touching to measure the temperature of patients. (   )

4 Write the scientific term for each of the following:

1. The device which is used to measure the temperature. *(Sohag 2018)* (..........)
2. The type of thermometers that is graduated from 35°C to 42°C. *(Qalubia 2017)* (..........)
3. The part of the medical thermometer that prevents mercury from going back to the bulb easily. (..........)
4. The liquid that is used in sterilizing the clinical thermometer. *(Dakahlia 2019)* (..........)
5. The part of the medical thermometer that is filled with mercury. (..........)
6. The instrument that is used for measuring the temperature of the human body. *(Cairo 2019)* (..........)

5 Correct the underlined words:

1. The main idea to make a thermometer is changing the <u>mass</u> of the liquid according to the temperature. *(Cairo 2019)* (..........)
2. The scale of the medical thermometer ranges from <u>0°C to 100°C</u>. *(Giza 2019)* (..........)
3. The <u>Celsius</u> thermometer is used in measuring the temperature of the human body. *(Dakahlia 2016)* (..........)
4. The medical thermometer has a <u>fraction</u> to prevent mercury from going back easily. (..........)
5. The <u>water</u> is the liquid metal used in making the thermometer. *(Sohag 2018)* (..........)

Lesson 2

6. Water is a liquid that is used in sterilizing the medical thermometer before using it. *(Alex. 2019)* (..............................)
7. The normal temperature of a healthy person is 32°C. *(Giza 2019)* (..............................)
8. We must shake the medical thermometer before using it to kill microbes. (..............................)

6 Give a reason for each of the following:

1. Measuring temperature is important in our daily life.
....
2. We cannot depend on the sense of touching to measure the temperature of objects.
....
3. In the medical thermometer, there is a constriction above the mercury bulb. *(Cairo 2019)*
....
4. The scale of the medical thermometer ends with 42°C.
....
5. The medical thermometer must be sterilized before using.
....
6. We must shake the medical thermometer well before using it. *(Beheira 2018)*
....
7. Thermometers must be kept out of children's reach.
....
8. It is dangerous to seize the thermometer firmly with our teeth.
....

7 What happens if ...?

1. There is no constriction in the medical thermometer. *(Cairo 2019)*
....
2. You use the medical thermometer without sterilizing it.
....
3. You use the medical thermometer without shaking it.
....

8 What is meant by ... ?

1. The thermometer.

....

2. The medical thermometer. *(Cairo 2019)*

....

9 What is the importance or the function of each of the following?

1. The thermometer. *(Gharbia 2014)*

....

2. The medical thermometer. *(Qena 2019)*

....

3. The constriction in the medical thermometer. *(Beni Suef 2019)*

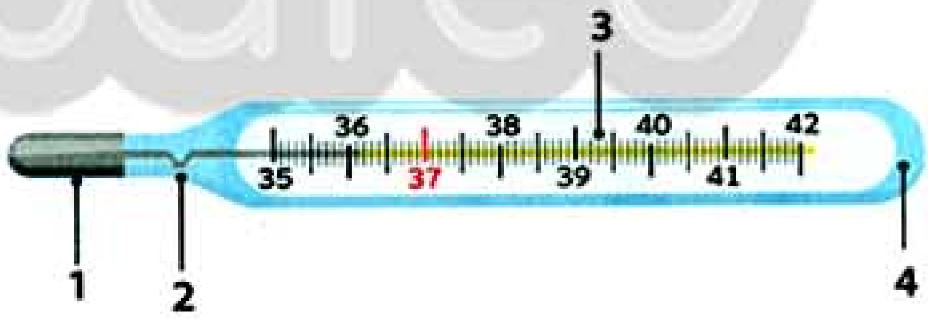
....

4. Ethyl alcohol during measuring the temperature of a patient.

....

10 Look at the following figure, then answer: *(Qena 2019)*

1. This figure represents ....
2. Label the figure:
   1. ....
   2. ....
   3. ....
   4. ....
3. This device is used for ....
4. The function of part 2 is ....



11 Explain the main idea of making the thermometer.

....

....

....

Lesson 2

Celsius thermometer

1 Choose the correct answer:

1. The temperature of liquids is measured by using the ....
   a. medical thermometer b. barometer
   c. Celsius thermometer d. (a) and (c)
2. The liquid which is used in making of the Celsius thermometer is...................... . *(Sohag 2018)*
   a. hydrogen peroxide b. water
   c. mercury d. alcohol
3. Celsius is the measurement unit of ....
   a. weight b. temperature c. volume d. mass
4. The lower point of the Celsius thermometer is .... and it represents the melting point of ice.
   a. 100°C b. 50°C c. 0°C d. 37°C
5. The upper point of the Celsius thermometer is .... and it represents the boiling point of water.
   a. 37°C b. 0°C c. 42°C d. 100°C
6. Mercury is characterized by ....
   a. expanding regularly by heating b. expanding irregularly by heating
   c. contracting by heating d. (a) and (c)
7. Mercury remains in liquid state between .... °C. *(Damietta 2019)*
   a. 39 : 357 b. 39 : - 357 c. -39 : 357 d. 0 : 100
8. The clinical thermometer is distinguished from the Celsius thermometer by the presence of a ....
   a. capillary tube b. glass bulb c. constriction d. (a) and (b)
9. We can measure the temperature of boiling water using the ....
   a. medical thermometer b. Celsius thermometer
   c. thermostat d. clinical thermometer
10. All the following are among the properties of mercury as a thermometric substance except that .... *(Sohag 2013)*
    a. it is a good conductor of heat b. its expansion is regular
    c. it gives a limited extent to measure the temperature
    d. it does not stick to the walls of the capillary tube
11. Zero degree Celsius is the melting point of ice and .... point of water.
    a. melting b. freezing c. boiling d. no correct answer

2 Complete the following sentences:

1. The .... thermometer is used to measure the water temperature. *(Port Said 2019)*
2. The scale of the Celsius thermometer starts from .... to .... *(South Sinai 2017)*
3. The .... thermometer has no constriction.
4. The liquid metal that can be seen easily through the thermometer glass is .... *(Assiut 2018)*
5. The melting point of ice is ...., whereas .... is the boiling point of water. *(Gharbia 2016)*
6. Mercury is a liquid metal that .... regularly by heating.
7. Mercury does not .... to the walls of the capillary tube.
8. Mercury remains .... between -39°C and 357°C. *(Giza 2019)*
9. The Celsius thermometer is used in measuring the temperature of .... whereas the medical thermometer is used in measuring the temperature of .... *(Cairo 2019)*

3 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. The Celsius thermometer is used for measuring the temperature of the human body. *(Cairo 2019)* (   )
2. The scale of the Celsius thermometer starts from 35°C to 42°C. (   )
3. Mercury is considered a bad conductor of heat. *(Cairo 2019)* (   )
4. Mercury gives a wide range for temperature measurement. *(Cairo 2019)* (   )
5. Alcohol does not stick to the walls of the capillary tube, so it is used in making thermometers. *(Port Said 2013)* (   )

4 Write the scientific term for each of the following:

1. The part of the medical thermometer that is filled with mercury. (....................)
2. The instrument that is used to measure the temperature of liquids. *(Sohag 2019)* (....................)
3. The type of thermometers whose scale ranges from 0°C to 100°C. (....................)
4. The lower point of the Celsius thermometer that represents the melting point of ice. (....................)
5. The upper point of the Celsius thermometer that represents the boiling point of water. (....................)

Lesson 2

5 Correct the underlined words:

1. The temperature of liquids is measured by the clinical thermometer. (..............................)
2. The graduation of the Celsius thermometer begins from 32°C until 100°C. *(Ismailia 2016)* (..............................)
3. The liquid used in making the Celsius thermometer is alcohol. *(Cairo 2019)* (..............................)
4. Mercury is a bad conductor of heat. *(Beheira 2018)* (..............................)
5. Mercury contracts regularly by heating. (..............................)
6. The highest degree in the Celsius thermometer represents the degree of water freezing. *(Cairo 2018)* (..............................)

6 Give a reason for each of the following:

1. The medical thermometer is not used in measuring the boiling point of water. *(Alex. 2014)*
   ....
2. The temperature of iced water cannot be measured by using the clinical thermometer.
   ....
3. Mercury is used in making thermometers. *(Giza 2019)*
   ....
4. Mercury gives a wide range to measure temperature. *(Menofia 2011)*
   ....

7 What happens if ...?

1. We put the medical thermometer in boiling water. *(Cairo 2019)*
   ....
2. Mercury is replaced by water in making of thermometers.
   ....
3. Increasing the temperature of mercury.
   ....

8 What is meant by ...?

The Celsius thermometer.

....

9 What is the importance or the function of each of the following?

1. The Celsius thermometer. *(South Sinai 2019)*

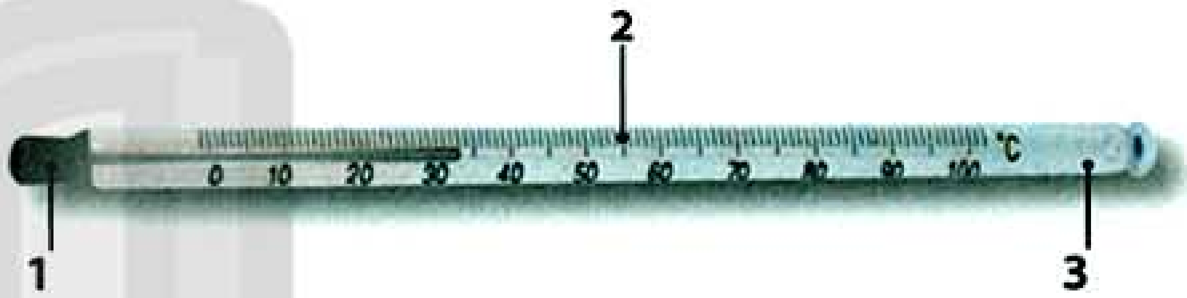
....

2. Mercury in thermometers. *(Cairo 2014)*

....

10 Look at the following figure, then answer: *(Qena 2019)*

1. This figure represents ....
2. Label the figure:
   1. ....
   2. ....
   3. ....
3. This device is used for ....



11 Compare between the medical thermometer and the Celsius thermometer:

(Port Said 2014)

Points of comparison	Medical thermometer	Celsius thermometer
1. Usage	....	....
2. Structure	....	....
3. Used liquid	....	....
4. Scale	....	....

12 Choose from column (A) what suits in column (B): *(Dakahlia 2014)*

1.

(A)	(B)
1. The clinical thermometer	a. is used to sterilize the clinical thermometer.
2. The Celsius thermometer	b. is used to measure the temperature of liquids.
3. Ethyl alcohol	c. is used to measure the temperature of the human body.
4. Mercury	d. is a liquid metal that expands regularly by heating.
5. The thermometer	e. is a device used to measure temperature.

1. .... 2. .... 3. .... 4. .... 5. ....

2.

(A)	(B)
1. Constriction	a. expands regularly by heating.
2. A glass bulb	b. kills microbes on the surface of the medical thermometer.
3. Mercury	c. prevents mercury from going back to the bulb easily.
4. Ethyl alcohol	d. is found in the medical thermometer and the Celsius thermometer.
5. Celsius	e. is the measuring unit of temperature.

1. .... 2. .... 3. .... 4. .... 5. ....

13 Answer the following questions: *(Menofia 2014)*

1. What are the types of thermometers?

....

2. Mention two differences between the types of thermometers.

....

TIMSS Like Questions

2 on Lesson

Answer Guide: P. 11

1. The given figure shows a piece of apparatus with two different readings:

a) (i) Write down the name of this piece of apparatus.

....

(ii) What does it measure?

....

b) Write down the readings shown by A and B and give the unit.

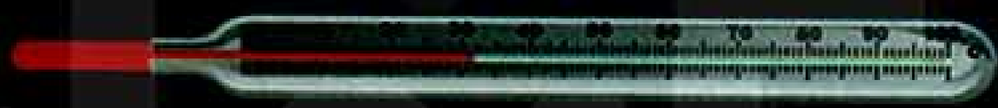
Reading of A : ....

Reading of B : ....



(A) (B)

2. The following figure shows a laboratory thermometer:



a) State the range of the thermometer.

....

b) Describe how the clinical thermometer differs from the Celsius thermometer. A diagram may be included in your answer.

....

....

3. Some students have ideas about the properties of the medical and Celsius thermometers.



Mohamed
It has no constriction.



Noha
Its scale is from 0°C to 100°C.



Mariam
Its scale is from 35°C to 42°C.



Doaa
It has a constriction above the mercury bulb.

a) Which two students are stating the properties of the Celsius thermometer?

....

b) Which two students are stating the properties of the medical thermometer?

....

4. Make a model of Celsius thermometer.

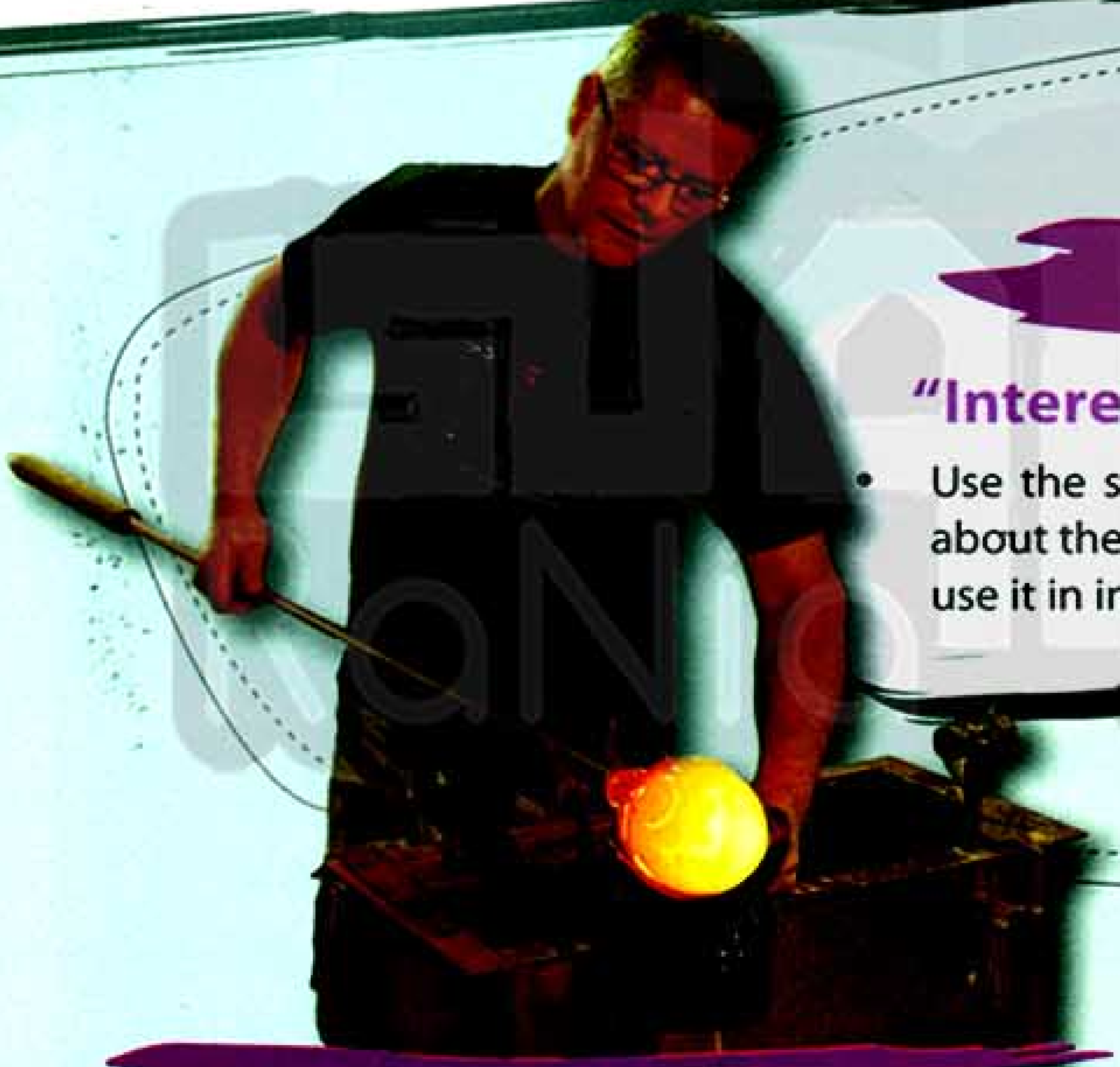
Unit 2 Think & Create

Assignment No. (1)



"Field visit"

- Participate with your classmates under supervision of your teacher in visiting a hospital where a doctor is measuring the temperature of a patient, try to know the type of the used device and how the doctor uses it.



Assignment No. (2)

"Interesting topic"

- Use the school library and the internet sites to search about the uses of heat energy in our life as you know we use it in industry or at home in various applications.

Assignment No. (3)



"Making a model"

- Use the available materials in your environment to make models of the medical and Celsius thermometers to measure the temperature.

Visit Egyptian Knowledge Bank to research further topics related to this Unit.

Unit 3

THE ATMOSPHERE



Lesson 1 Oxygen

Objectives:

- Identifying the composition of air.
- Describing how to prepare oxygen in the lab.
- Determining the importance and uses of oxygen.
- Identifying the source of oxygen.
- Identifying the properties of oxygen.

Lesson 2 Carbon Dioxide

Objectives:

- Identifying the sources of carbon dioxide emission.
- Describing how to prepare carbon dioxide in the lab.
- Identifying the properties of carbon dioxide.
- Determining the importance and uses of carbon dioxide.

Lesson 3 Nitrogen

Objectives:

- Identifying the sources of nitrogen.
- Identifying the percentage of nitrogen.
- Identifying the structure of the nitrogen gas.
- Identifying the importance and the uses of nitrogen.

LESSON 1 Oxygen



Brain Gym

Guess what will happen if there is no air (atmosphere) surrounding Earth. (Tick)



- Can living organisms breathe?

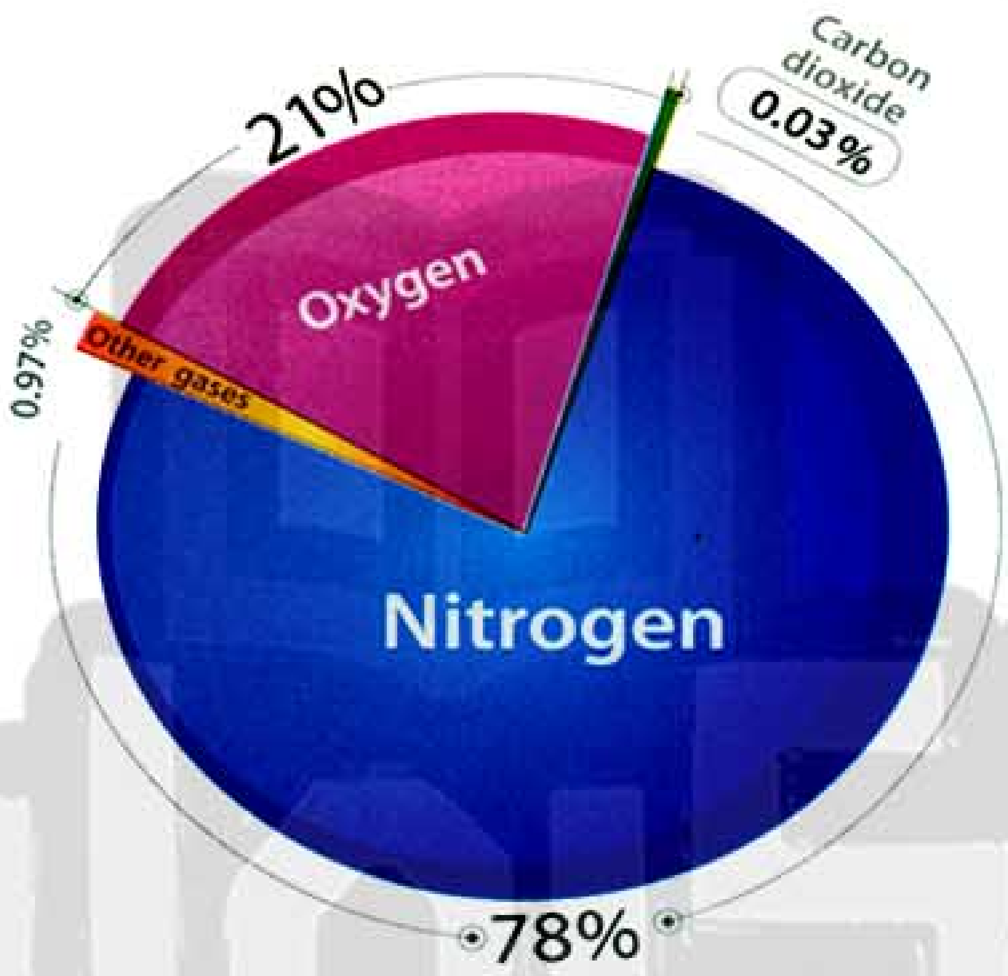
  Yes ◯ **Or** No ◯

- **So, let's know more about the atmosphere, its components and its importance.**

The Earth's atmosphere: It is a mixture of gases surrounding the earth and is attracted to it by the effect of gravitational force.

The components of the atmosphere:

- The atmosphere is composed of a mixture of gases surrounding the earth.



Do you know?

Two gases - nitrogen and oxygen - make up 99 percent of the air we breathe.

Nitrogen	(**78%** of the volume of the atmosphere)
Oxygen	(**21%** of the volume of the atmosphere)
Carbon dioxide and other gases like (water vapor, argon, neon, helium)	(**1%** of the volume of the atmosphere)

N.B. Oxygen, the second most common gas in the atmosphere, is produced in photosynthesis process by plants, algae, and plant-like protists (ex. Euglena).

Lesson 1

Effects of the Earth's atmosphere:

1. It protects the earth by absorbing harmful ultraviolet rays which come from outer space.



2. It adjusts the temperature of the earth's surface.



N.B.

- There are large quantities of solid objects in the atmosphere such as dust particles and air pollutants (smokes, gases) which are produced by factories, cars, trains and ships.
- The solid objects help in the condensing of the water vapor around and falling in the form of water drops of rains and snow.



Check point Complete the following sentences: *(Answer Guide: P. 11)*

1. The atmosphere consists of a mixture of .... surrounding ....
2. The atmosphere is attracted to the earth by the effect of ....
3. The percentage of oxygen gas in the atmosphere is ....
4. The importance of the atmosphere is .... and ....



Oxygen gas

- Oxygen is very important to all living organisms for respiration.

Chemical structure of oxygen gas:

1. It consists of two oxygen atoms that have the formula O_2.
2. Oxygen exists in the atmosphere in a gaseous state.

Do you know?

Oxygen was discovered in China in 800 B.C. Then, it was re-discovered by Joseph Priestley in 1774.

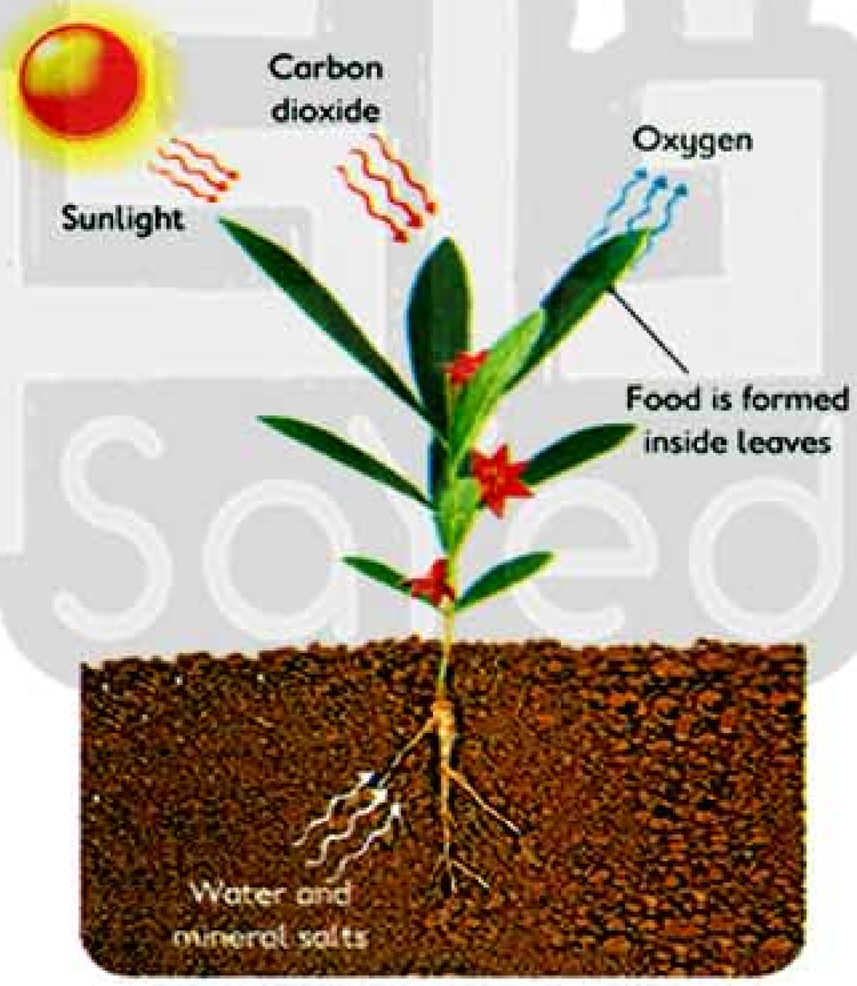


Do you know?

Antoine Lavoisier gave it the name "oxygen" in 1778.

The source of oxygen gas:

1. The main source of oxygen is the green plants on the earth.
2. Oxygen is produced during photosynthesis process to compensate its loss through respiration and burning processes, so it is important to keep the green cover in cities.



NOTE

In photosynthesis process, plants take:

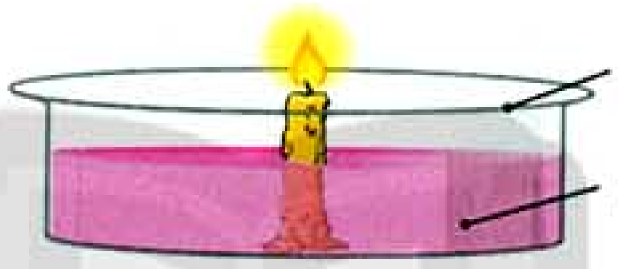
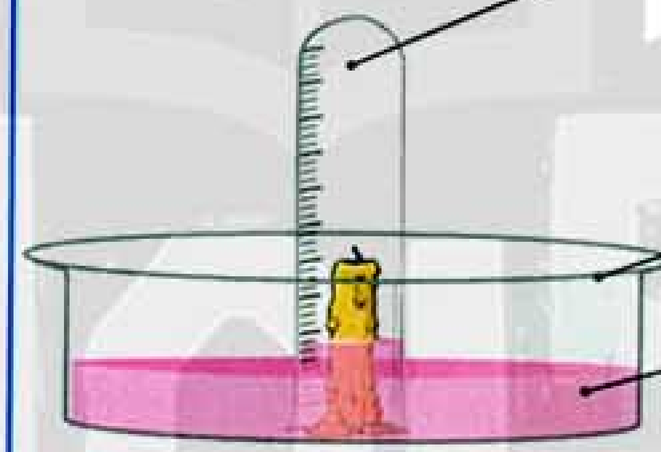
1. Carbon dioxide gas from air.
2. Water and mineral salts from soil.
3. Sunlight to produce oxygen gas and nutrients.

Lesson 1

Activity

To show that the percentage of oxygen gas equals 21% (1/5) of the air volume:

Materials: A basin containing colored water - a candle - a graduated cylinder.

Steps	Illustration	Observation
1 Put colored water in the basin after fixing a lighted candle.		
2 Cover the lighted candle with a graduated cylinder and watch the level of water. 3 Calculate the volume of water that rises up.		The lighted candle is turned off and water rises up into the cylinder with one fifth (1/5) of its volume.

Explanation

This occurs as a result of air's loss of one of its components, oxygen, that is consumed by the candle during burning, so water replaces the consumed oxygen and enters the cylinder by a ratio one fifth (21%).

Conclusion

The atmospheric air includes oxygen gas that helps in burning and occupies one fifth (21%) of the air volume.

G.R. The ratio of oxygen gas in the atmosphere is a fixed ratio although it is consumed during respiration and burning processes.

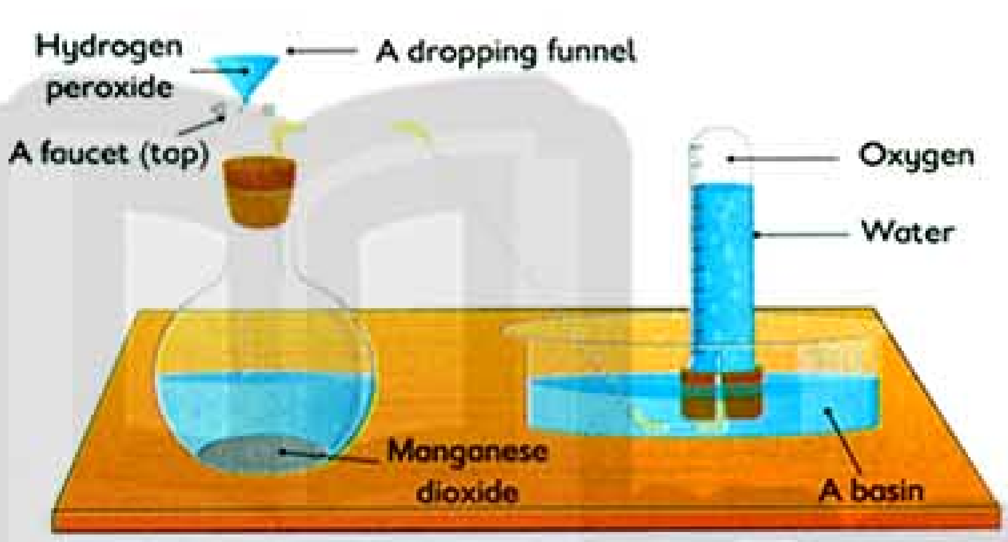
Because it is compensated by green plants during photosynthesis process.

Preparation of oxygen gas in the lab:

Activity

To prepare oxygen gas in the lab:

Materials: A basin - a flask - a dropping funnel - a faucet (tap) - a cylinder - hydrogen peroxide - manganese dioxide.

Steps	Illustration	Observation
1 Set the apparatus as shown in the figure. 2 Put some manganese dioxide in the flask. 3 Through the top of the funnel, add some hydrogen peroxide to manganese dioxide.		1. The solution is bubbling. 2. The formation of a gas at the top of the inverted cylinder.

Explanation

1. Bubbles of oxygen gas evolved in the flask. As more and more hydrogen peroxide is added, more oxygen is formed and the water in the cylinder moves downward.
2. Oxygen is collected by the downward displacement of water. **G.R.**
   As oxygen rarely dissolves in water.

Conclusion

Hydrogen peroxide (oxygen water) dissociates in the presence of manganese dioxide (as a catalyst) into water and oxygen gas.

$$\text{Hydrogen peroxide} \xrightarrow[\text{(As a catalyst)}]{\text{Manganese dioxide}} \text{Water + Oxygen}$$

Catalyst: It is a chemical substance used in the chemical reaction to speed up the rate of the reaction, without any change in its quantity or its properties.

G.R. Manganese dioxide works as a catalyst in preparing oxygen gas.
As it speeds up the rate of reaction without causing any change in its quantity or its properties.

Benchmark

Selected from Previous Exams

(Answer Guide: P. 11)

1. Complete the following sentences:

1. .... gas is produced during photosynthesis and .... gas is produced during combustion. (Cairo 2020)
2. Oxygen gas of the atmosphere is consumed during .... and .... (Gharbia 2015)
3. Oxygen gas is prepared from .... in the presence of .... (Cairo 2019)
4. .... is a catalyst used in dissociation of hydrogen peroxide. (Cairo 2019)

2. Choose the correct answer:

- Hydrogen peroxide dissociates in the presence of manganese dioxide into .... (Cairo 2019)

  a. oxygen and hydrogen
  b. oxygen and water
  c. hydrogen and water
  d. carbon dioxide and air

3. Give a reason for each of the following:

1. The ratio of oxygen is constant in air. (Giza 2019)

   ....

2. The atmosphere has great importance for the continuity of life on Earth. (Giza 2019)

   ....

4. What happens if ...?

1. There is no atmosphere. (Giza 2020)

   ....

2. The ratio of oxygen gas in air decreases. (Qena 2016)

   ....

5. What is the importance or the function of each of the following?

1. The atmosphere. (Sohag 2017)

   ....

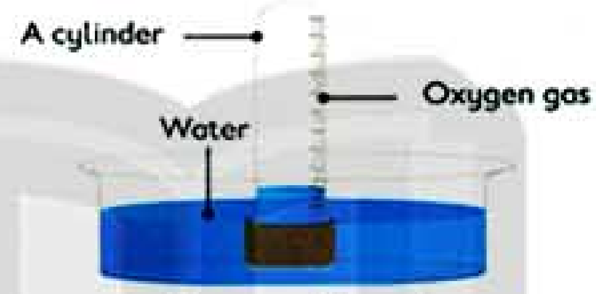
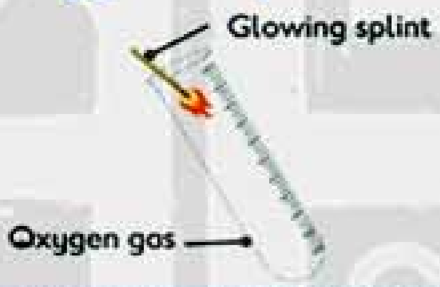
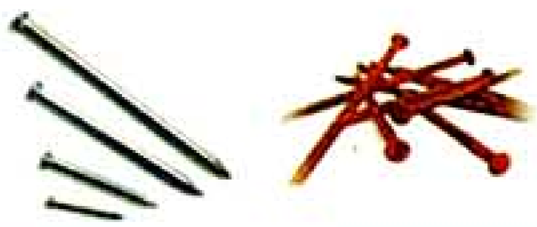
2. The air pollutants.

   ....

TRY TO SOLVE
Worksheet 8
Page 33

Properties of oxygen gas:

Use the previous apparatus that is used for preparing oxygen to collect more oxygen gas needed to explore its properties:

Steps	Observation	Conclusion
1 Check the color, taste and smell the odor of the gas.	• Oxygen has no color, taste or odor. 	• Oxygen is colorless, tasteless and odorless.
2 Invert one of the cylinders full of oxygen gas in a basin full of water. Does the water go up inside the cylinder?	• Water rises up very little (slightly).  • Oxygen is collected by downward displacement of water. G.R. Because it is scarcely (rarely) soluble in water.	• Oxygen scarcely (slightly) dissolves in water.
3 Put a glowing splint in a cylinder of oxygen.	• Splint glows more again in the cylinder filled with oxygen. G.R. Because oxygen helps in burning. 	• Oxygen does not burn, but it helps in burning.
4 a. Turn an oxygen-filled tube over another air-filled cylinder. b. Insert a glowing splint in the upper cylinder, then the lower cylinder.	• The splint glows more in the lower beaker only. 	• Oxygen replaces air in the lower cylinder, because it is heavier than air.
5 Wet some nails with water and keep them for several days in a humid atmosphere.	• Iron nails are covered by a reddish brown layer of rust. 	• Oxygen combines with most elements forming oxides. • The slow union between other elements and oxygen in the presence of moisture is called "oxidation".
6 Insert a lighted magnesium ribbon in a cylinder filled with oxygen.	• A white matter produced. 	• Oxygen combines with lighted magnesium to form magnesium oxide which a white matter.

Lesson 1

Direct combination of oxygen with elements:

- Oxygen combines directly with most elements according to the following equation:

Element + Oxygen ⟶ Element oxide

- There are two types of the direct combination of oxygen with elements:

A Oxidation (Rusting)



Definition

- It is a slow combination of oxygen with elements in the presence of water (moist medium).

Effect

- It causes erosion and damage of the ironware.
- Ironware has to be isolated by painting. G.R.

To be protected from rusting.

Ex. Iron rusting.

B Combustion (Burning)



Definition

- It is a rapid combination of oxygen with elements and it produces heat and light.

Effect

- The mass of the object increases after the combustion.

Ex. Burning a piece of cleansing wire.

Do you know?

Oxygen has a neutral effect on blue or red litmus paper.

G.R. The mass of nails after rusting is more than before rusting.

Because iron reacts with oxygen forming iron oxide.

Activity

Does the mass of materials increase after the combination with oxygen?

Materials: Cleansing wire (steel wool) – a flame – a digital scale.

Steps	Illustration	Observation
1 Make two balls of steel wool equal in their masses. 2 Catch one ball by using a pair of tongs and burn it on a flame.		The burned ball has a larger mass than the unburned one.
3 When the inner part of the ball becomes red, put it in a plate made of aluminum or iron till the fire goes out. 4 Measure the mass of the two balls again using the digital scale.		

Conclusion

- Cleansing wire burns with a flame. **G.R.**
  Because it has a much greater surface area which increases its reaction with oxygen.
- During combustion process, a compound is formed known as iron oxide which increases the mass of steel wool.

G.R. The mass of cleansing wire increases after burning.

Because iron reacts with oxygen forming iron oxide.

TRY TO SOLVE
Worksheet 9
Page 35

Lesson 1

Importance and uses of oxygen gas:

- Oxygen gas is very important and essential for all living organisms.

1



- Water is formed by the combination between oxygen and hydrogen.
- Water molecule consists of 2 hydrogen atoms and 1 oxygen atom.

2



- Oxygen is essential for respiration and food burning processes to produce energy for other biological vital processes.

3



- Oxygen is mixed with acetylene gas to form oxyacetylene flame (3500°C) that is hot enough to melt metals, so it is used in welding and cutting metals.

4



- The ozone molecule is formed by the combination of three oxygen atoms and it forms a layer in the atmosphere called the ozone layer. G.R.

To protect the earth from harmful rays coming from the sun.

5



- Oxygen gas is compressed inside iron cylinders for different **uses:**

a



Diving underwater G.R.

To respire under water.

b



Artificial respiration for people suffering from difficulty in respiration.

c



During surgical operations.

d



Mountain climbers use oxygen. G.R.

Because it is heavier than air, so it decreases as we rise above the earth's surface.

Lesson Overview

Summary

The Earth's atmosphere: It is a mixture of gases surrounding the earth and is attracted to it by the effect of gravitational force.

Oxygen gas



Hydrogen peroxide $\xrightarrow[\text{Manganese dioxide (catalyst)}]{\text{Decomposition by}}$ **Water + Oxygen**

Properties of oxygen gas

- Oxygen combines with lighted magnesium to form magnesium oxide which is a white matter.
- Oxygen (O_2) is colorless, tasteless and odorless.
- Oxygen combines directly with most elements forming oxides.
- Oxygen is heavier than air, so it replaces air.
- Oxygen is scarcely (slightly) soluble in water.
- Oxygen does not burn, but it helps in burning.

Importance and uses of oxygen gas

1. It is used in Respiration and combustion.
2. Oxygen forms the ozone layer in the atmosphere.
3. Oxygen gas is compressed in iron cylinders.
4. Oxygen combines with acetylene gas to produce oxyacetylene flame.

Now, I am able to:

- Define the atmosphere. ☐
- List the components of the atmosphere. ☐
- Write the chemical structure of oxygen gas. ☐
- Differentiate between the sources and uses of oxygen gas. ☐
- Determine the chemical substances used during preparing oxygen in the laboratory. ☐
- Mention the properties of oxygen gas. ☐

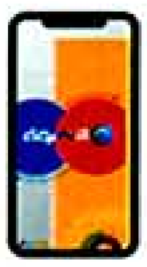
Language Focus

atmosphere	الغلاف الجوى
consume	يستهلك
compensate	تعويض
dissociate	يتفكك
catalyst	عامل حفاز
downward displacement	إزاحة سفلية
erosion	تآكل
essential	ضرورى
welding	لحام

References

Ministry of Education (MOE) Books

Egyptian Knowledge Bank



Al-Adwaa Application

- Al-Adwaa e-book
- Al-Adwaa Videos
- Al-Adwaa Question Bank

School Book Exercises on Lesson 1

Answer Guide: P. 12

1 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. Oxygen gas is produced according to the availability of green plants during photosynthesis process. (   )
2. Oxygen gas is prepared from hydrogen peroxide dissociated in the presence of carbon dioxide gas. *(Aswan 2018)* (   )
3. The mass of materials decreases after combination with oxygen. *(Dakahlia 2017)* (   )
4. Ozone gas is composed of 2 oxygen atoms and its symbol is O_3. *(Cairo 2019)* (   )
5. The erosion of the material which is made of iron occurs when exposed to moisture. *(Giza 2018)* (   )
6. Oxygen combines with a lighted magnesium ribbon forming a white substance. *(Cairo 2019)* (   )

2 Think and answer: If you know that oxygen does not burn but helps in burning. What happens to our lives if the oxygen percentage in the air is more than 21%?

....

....

3 Give a reason for:

1. Although oxygen is consumed during respiration, its percentage remains stable in the atmosphere. *(Giza 2020)*

   ....

   ....

2. Oxygen is produced by downward displacement of water in the flask during its preparation in the laboratory. *(Giza 2019)*

   ....

   ....

3. The atmosphere has great importance for the continuity of life on the planet. *(Dakahlia 2019)*

   ....

   ....

4 Oxygen has great importance for life on the planet. Water consists of oxygen united with hydrogen. Give other examples of the importance of oxygen and its uses. *(Cairo 2019)*

....

....

....

....

....

....

5 Write the properties of oxygen gas in the following info graph:

Oxygen gas

....	....	....	....	....

Al-Adwaa Exercises on Lesson 1

Answer Guide: P. 12

The Earth's atmosphere

Oxygen gas (structure - sources and preparation)

1 Choose the correct answer:

1. The most abundant element in the Earth's atmosphere is .... *(Kafr El-Sheikh 2013)*
   a. water b. nitrogen c. oxygen d. carbon dioxide
2. The percentage of .... is very little, about 0.03%.
   a. water b. nitrogen c. oxygen d. carbon dioxide
3. Oxygen gas represents ....% of the Earth's atmosphere.
   a. 0.03 b. 21 c. 78 d. 12
4. The main source of oxygen gas in air is produced from .... *(Cairo 2014)*
   a. photosynthesis b. respiration c. combustion d. burning
5. The chemical formula of oxygen molecule is .... *(Suez 2013)*
   a. CO_2 b. O_2 c. O_4 d. O_3
6. Respiration and combustion processes consume .... gas. *(Giza 2018)*
   a. oxygen b. nitrogen c. argon d. carbon dioxide
7. Photosynthesis process requires the presence of .... *(South Sinai 2017)*
   a. carbon dioxide gas b. water and mineral salts
   c. chloroplasts and light energy d. (a), (b) and (c)
8. The catalyst used in the preparation of oxygen in the lab is ....
   a. hydrogen peroxide b. calcium carbonate
   c. manganese dioxide d. calcium hydroxide
9. Hydrogen peroxide is used in the preparation of .... *(Menofia 2016)*
   a. hydrogen b. oxygen c. nitrogen d. carbon dioxide
10. Hydrogen peroxide decomposes in the presence of manganese dioxide to .... *(Cairo 2019)*
    a. oxygen and hydrogen b. oxygen and water
    c. hydrogen and water d. hydrogen and manganese

11. Oxygen gas occupies about .... of the air volume.

a. $\frac{4}{5}$ b. $\frac{1}{5}$ c. $\frac{1}{4}$ d. $\frac{3}{4}$ *(Cairo 2012)*

12. Oxygen is collected by the .... displacement of ....

a. upward - water
b. downward - air
c. downward - water
d. upward - air

13. The atmosphere contains oxygen gas, nitrogen gas and carbon dioxide gas. What is the arrangement of these gases according to their ratio from the highest to the lowest?
– .... *(Ismailia 2013)*

a. Nitrogen, carbon dioxide and oxygen
b. Oxygen, nitrogen and carbon dioxide
c. Nitrogen, oxygen and carbon dioxide
d. Carbon dioxide, oxygen and nitrogen

2 Complete the following sentences:

1. The Earth's atmosphere is .... *(Menofia 2014)*
2. The atmosphere protects the earth by absorbing .... radiations coming from outer space. *(Damietta 2013)*
3. The oxygen gas is produced plentifully from .... during .... process.
4. The main source of oxygen is ....
5. The percentage of oxygen gas in the atmosphere equals .... *(Giza 2014)*
6. Manganese dioxide increases the decomposition of .... into oxygen and water.
7. The atmosphere is attracted to the earth by the effect of ....
8. Smoke and dust particles present in the atmosphere help in the .... of water vapor in the air and falling in the form of .... or ....
9. Oxygen is consumed in .... and .... processes. *(Giza 2019)*
10. Oxygen gas is collected by the displacement of .... downward because oxygen does not dissolve in water. *(Cairo 2011)*

Lesson 1

11. Manganese dioxide acts as a .... in the preparation of oxygen in the lab.

12. Nitrogen represents ....% of the total percentage of the atmosphere, while .... represents 21% of the volume of the atmosphere.

13. .... gas is used in photosynthesis process that green plants make, while .... gas is produced during this process. *(Sohag 2018)*

3 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. The atmosphere is composed of a mixture of gases surrounding the earth. (   )
2. Oxygen represents 78% of the air volume. (   )
3. Nitrogen peroxide acts as a catalyst in the preparation of oxygen gas. (   )
4. Hydrogen peroxide is decomposed into nitrogen and water. (   )
5. During photosynthesis process, plants absorb oxygen and produce carbon dioxide. (   )

4 Write the scientific term for each of the following:

1. The mixture of different gases that surrounds the earth's surface and is attracted to it by gravity. *(Ismailia 2011)* (....................)
2. The gas that represents one fifth of the volume of the atmosphere. (....................)
3. Objects that help in the condensation of water vapor and falling of rains. (....................)
4. It is needed in respiration and combustion. *(Cairo 2017)* (....................)
5. The gas produced from green plants during photosynthesis process. *(Dakahlia 2017)* (....................)
6. The chemical substance that decomposes into water and oxygen during the preparation of oxygen in the laboratory. *(Sohag 2017)* (....................)
7. The catalyst which is used during the preparation of oxygen. *(Qalubia 2019)* (....................)
8. The substance that remains without any change in its quantity and properties during the chemical change. (....................)
9. The method by which oxygen gas is collected during its preparation in the laboratory. *(Assiut 2014)* (....................)

5 Correct the underlined words:

1. Respiration and combustion processes consume CO_2. *(Beheira 2018)* (..............................)
2. Oxygen molecule consists of three atoms. *(Gharbia 2017)* (..............................)
3. Oxygen gas represents 78% of the Earth's atmosphere. *(Alex. 2014)* (..............................)
4. Oxygen gas is prepared from hydrogen peroxide dissociated in the presence of carbon dioxide. *(Fayoum 2017)* (..............................)
5. Nitrogen peroxide gas is decomposed to water and oxygen in the presence of manganese dioxide. *(Giza 2019)* (..............................)
6. Hydrogen peroxide is used as a catalyst in preparing oxygen in the lab. *(Alex. 2018)* (..............................)
7. Hydrogen peroxide is used in the preparation of nitrogen. *(Sharkia 2014)* (..............................)
8. Oxygen is prepared by displacing the air downward in the flask during preparation in the laboratory. *(Cairo 2014)* (..............................)

6 Give a reason for each of the following:

1. The atmosphere has great importance for the continuity of life on the earth. *(Ismailia 2016)*

   ....

2. Although oxygen is consumed during respiration, its percentage remains stable in the atmosphere. *(Cairo 2020)*

   ....

3. Increasing the green plants on the earth is very important.

   ....

4. Manganese dioxide remains without any change in its quantity and properties during the preparation of oxygen. *(Sohag 2017)*

   ....

5. Oxygen is collected by displacing the water downward in the flask during preparation in the laboratory. *(Dakahlia 2019)*

   ....

7 What happens if ...?

1. There is no atmosphere.

   ....

2. There are no green plants on the earth's surface.

   ....

3. There's no oxygen in the atmosphere. *(Port Said 2019)*

   ....

4. The percentage of oxygen gas decreases in the atmosphere. *(Port Said 2012)*

   ....

5. Oxygen percentage in the atmosphere is more than 21%.

   ....

6. Hydrogen peroxide is dropped over manganese dioxide. *(Dakahlia 2019)*

   ....

7. We do not use manganese dioxide in preparing oxygen in the lab.

   ....

8 Compare between ...:

– The percentages of oxygen, carbon dioxide and nitrogen gases in the atmosphere.

9 Define:

– Catalyst.

....

10 What is the importance or the function of ...?

– Catalyst.

....

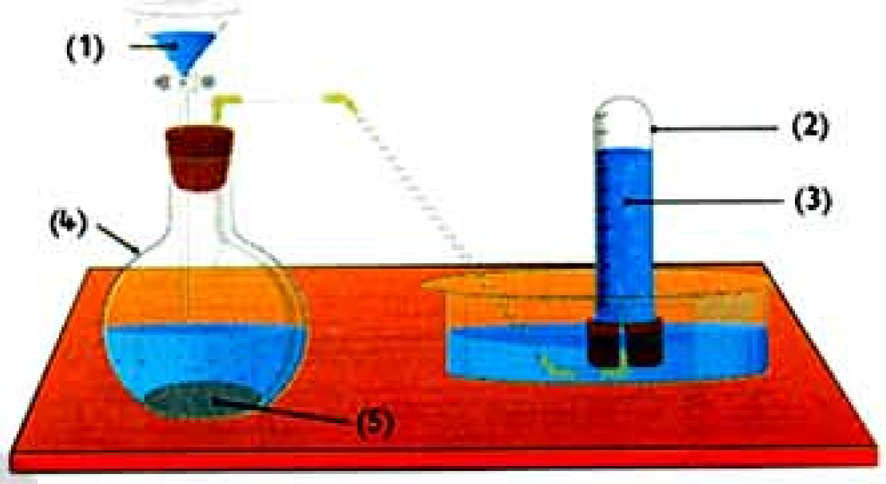
11 Mention the role of manganese dioxide in the preparation of oxygen in the lab. *(Sohag 2018)*

....

....

12 **Look at the apparatus used in the preparation of oxygen in the lab, then answer the questions below:** *(Cairo 2019)*

1. Write the labels:



   1. ....
   2. ....
   3. ....
   4. ....
   5. ....

2. Write the function of no. 5 and describe what happens to it at the end of the reaction.

   ....

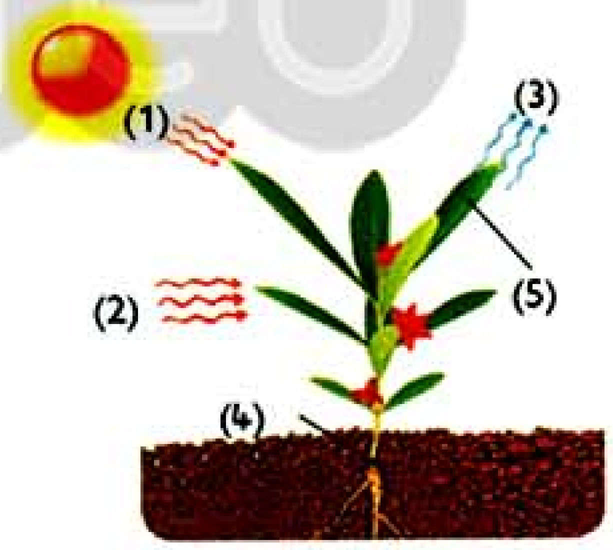
3. How is oxygen collected? Why?

   ....

13 **Write the components of the atmosphere and mention the percentage of each of them.**

....

14 **Notice the following figure, then write the labels:** *(Aswan 2016)*



1. ....
2. ....
3. ....
4. ....
5. ....

15 **Show by drawing the preparation of oxygen in the lab.**

....

....

Lesson 1

Properties of oxygen gas

1 Choose the correct answer:

1. The gas that does not burn but helps in burning is ....
   a. nitrogen b. acetylene c. oxygen d. hydrogen

2. Oxygen combines with lighted magnesium forming a white material called ....
   a. iron oxide b. magnesium oxide c. magnesium dioxide d. manganese dioxide

3. Rust is the .... layer formed when iron and oxygen react in humid air.
   a. magnesium oxide b. iron oxide c. white d. hydrogen peroxide

4. .... protects the earth from ultraviolet radiations.
   a. Ozone b. Nitrogen c. Oxygen d. Carbon dioxide

5. .... is a form of oxygen with 3 oxygen atoms in each molecule.
   a. Ozone b. Nitrogen c. Oxygen d. Carbon dioxide

6. .... gas is used with acetylene to weld metals. *(Cairo 2019)*
   a. Oxygen b. Nitrogen c. Carbon dioxide d. Hydrogen

7. The temperature of oxyacetylene flame is ....°C.
   a. 350 b. 1000 c. 35 d. 3500

8. When oxygen combines with an element, the mass of the product is .... the mass of the element. *(Damietta 2019)*
   a. more than b. less than c. equal to d. double

9. Bridges are covered with .... to protect them from rusting.
   a. alkaline b. acid c. wax d. paint

10. When oxygen combines rapidly with elements and produces heat and light, this union is called .... *(Ismailia 2017)*

a. combustion
b. oxidation
c. neutralization
d. decomposition

11. Which of the following gases form water molecule? – ....

a. Hydrogen and oxygen
b. Nitrogen and oxygen
c. Oxygen and nitrogen
d. Carbon dioxide and nitrogen

2 Complete the following sentences:

1. Oxygen gas is scarcely soluble in ....
2. Oxygen gas combines directly with most elements forming ....
3. Water molecule consists of two .... atoms and one .... atom.
4. .... protects the earth from harmful radiation that comes from the sun.
5. The rapid combination between oxygen and other elements producing heat and light is called ...., while the slow combination between them in the presence of moisture is called .... *(Menofia 2017)*
6. Divers use .... cylinder during diving underwater. *(Giza 2017)*
7. The oxygen molecule consists of .... atoms, while the .... molecule consists of three oxygen atoms.
8. .... and .... are among the uses of oxygen gas. *(Cairo 2019)*
9. Oxyacetylene flame is used for .... and .... of metals.
10. The mass of steel wool .... after burning.
11. Iron nails rust when exposed to .... and ....
12. If the ozone layer is damaged, ... will harm the earth.

Lesson 1

3 Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

1. Oxygen gas is colorless, tasteless and odorless. *(Qalubia 2013)* ( )
2. Oxygen gas easily dissolves in water. ( )
3. Oxygen is heavier than air. ( )
4. Oxygen does not burn and it does not help in burning. ( )
5. The ozone layer protects the earth from the harmful radiations that come from the sun. *(Cairo 2012)* ( )
6. Water molecule is formed of 1 oxygen atom and 2 hydrogen atoms. *(Cairo 2019)* ( )
7. The molecule of ozone gas consists of four oxygen atoms. *(Alex. 2013)* ( )
8. A catalyst changes its properties after the reaction. ( )
9. Oxygen reacts with most elements slowly in burning process. ( )
10. Rusting of iron happens quickly. ( )
11. Erosion may happen to bridges if they are left without painting. ( )
12. Iron oxide is formed when iron reacts with oxygen in dry air. ( )
13. Oxyacetylene flame is formed when ozone and acetylene burn. ( )
14. Oxyacetylene flame is used in cutting and welding metals. *(Kafr El-Sheikh 2017)* ( )
15. Oxygen cylinders are used in diving and in hospitals. ( )
16. When iron reacts with oxygen, its mass decreases. ( )

4 Write the scientific term for each of the following:

1. A layer formed when iron is exposed to moist air. (..............................)
2. It is formed when oxygen combines with magnesium. (..............................)
3. A slow union of oxygen with an element in the presence of moisture. (..............................)
4. A rapid union of oxygen with an element producing heat and light. (..............................)

5. A chemical substance formed when oxygen combines with most elements. (..............................)

6. The gas which is necessary for rusting process. *(South Sinai 2017)* (..............................)

7. A gas molecule consisting of three atoms of oxygen. *(Sohag 2018)* (..............................)

8. The layer that consists of 3 oxygen atoms (O_3) and protects the earth from harmful radiation. *(Giza 2019)* (..............................)

9. It consists of two hydrogen atoms and one oxygen atom. *(Cairo 2019)* (..............................)

10. The gas that is used for patients who suffer from breathing difficulties. *(Cairo2019)* (..............................)

11. A flame used in cutting and welding metals. *(Cairo 2019)* (..............................)

12. The gas that combines with O_2 to produce a flame with high temperature reaching 3500°C. *(Giza 2019)* (..............................)

5 Correct the underlined words:

1. Nitrogen does not burn, but it helps in burning. *(Menofia 2014)* (..............................)

2. Carbon dioxide gas is essential to form rust. *(Suez 2016)* (..............................)

3. Nitrogen and carbon are essential elements in the composition of water. (..............................)

4. Ozone molecule consists of 4 atoms of oxygen. *(Cairo 2019)* (..............................)

5. Carbon dioxide gas evolves as a result of decomposing hydrogen peroxide under the effect of manganese dioxide. *(Beni Suef 2014)* (..............................)

6. Oxygen is very soluble in water. (..............................)

7. When iron reacts with oxygen, its mass decreases. (..............................)

8. Rusting happens in the presence of nitrogen in humid air. (..............................)

9. We protect bridges' pillars by keeping them wet. (..............................)

6 Give a reason for each of the following:

1. The mass of cleansing wire increases after burning. *(Cairo 2019)*

   ....

2. We cannot use oxygen in fire extinguishing.

   ....

3. A burning match is still burning when it is placed in a cylinder filled with oxygen.

   ....

4. Rusting of iron has many disadvantages.

   ....

5. The pillars of the bridges are isolated from the atmospheric air by paints. *(Ismailia 2017)*

   ....

6. Ozone layer is very important for the life of all living organisms. *(Sohag 2017)*

   ....

7. Mountain climbers use oxygen cylinders. *(Cairo 2017)*

   ....

8. Oxyacetylene flame is used in welding and cutting metals. *(Ismailia 2019)*

   ....

9. Oxygen has great importance for life on the planet. *(Sohag 2014)*

   ....

7 What happens if ...?

1. Inverting a cylinder of oxygen on a burning candle.

....

2. A nail moistened with water is exposed to a humid atmosphere for several days. *(Cairo 2019)*

....

3. Bridges' pillars are not painted.

....

4. The mass of cleansing wire before and after heating. *(Matrouh 2013)*

....

5. There is no ozone layer.

....

6. Burning a mixture of oxygen and acetylene gas.

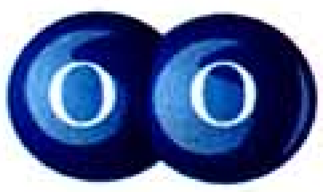
....

8 Compare between ...:

1. Oxidation and combustion. *(Giza 2019)*
2. The structure of oxygen and ozone molecules.

9 Write the names of the following molecules:

(a)



....

(b)



....

(c)



....

10 Define:

1. Oxidation.

....

2. Burning or combustion.

....

11 What is the importance or the function of each of the following?

1. Ozone layer. *(Cairo 2019)*

....

2. The oxyacetylene flame. *(Giza 2019)*

....

TIMSS Like Questions on Lesson 1

Answer Guide: P.14

1. Some metal railings have started to rust.



a. Which metal were the railings made of?

Circle the correct answer:

aluminum copper iron lead

b. Which two substances must be present for the railings to rust?

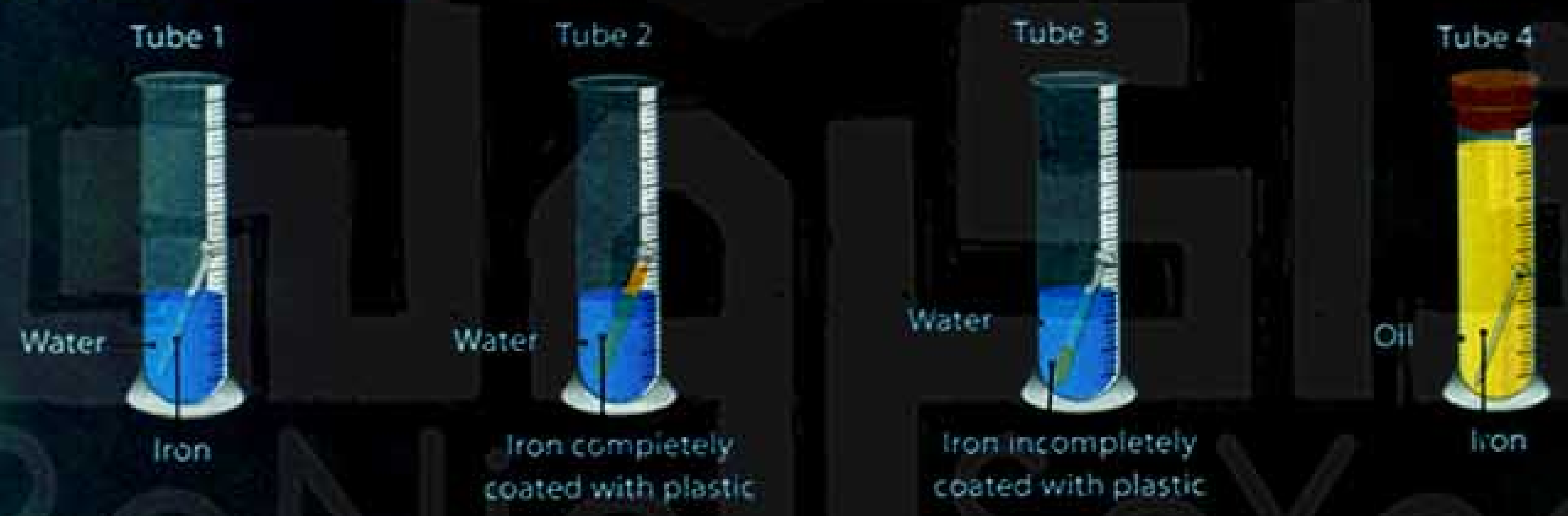
Circle the two correct answers:

carbon dioxide hydrogen nitrogen oxygen water

c. How can you prevent the railings from rusting?

....

2. A student investigates various methods of protecting iron from rusting. He sets up four tubes as shown in the diagram below.



a. Tube (1) contains unprotected iron. What is the purpose of this experiment?

....

b. State the names of the two substances needed for iron to rust.

.... and ....

c. Explain why the iron in tube (4) does not rust.

....

d. Explain why the iron in tube (3) eventually rusts.

....

....

3. The green cover is important for increasing the percentage of oxygen in the air.

Make a model of a greenhouse using simple materials.

LESSON 2 Carbon Dioxide

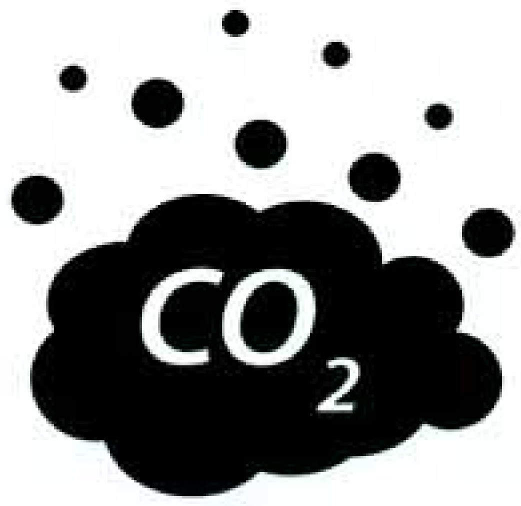


Brain Gym

Carbon dioxide gas is one of the most important components of atmosphere:

According to the previous sentence, answer the following questions:

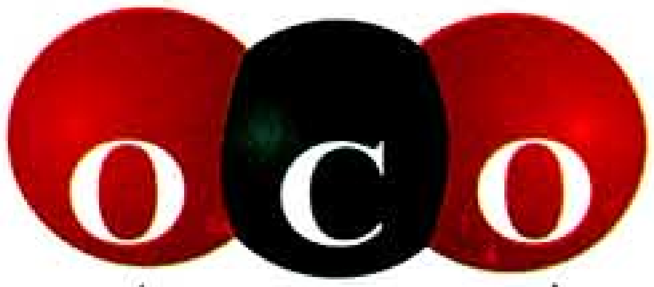
- The percentage of CO_2 in air is ....
- Green plants use CO_2 to form their food during .... process.
- **Let's learn more about carbon dioxide gas.**



Carbon dioxide gas

1. Chemical structure of carbon dioxide gas:

1. Formula: (CO_2)
2. It is found in a gaseous state at normal conditions.
3. Its molecule consists of two oxygen atoms (O_2) linked to a single carbon atom (C).



2. Sources of carbon dioxide gas:



1. • Respiration of all living organisms during exhalation process.



2. • Burning of fuels in factories and means of transportation.

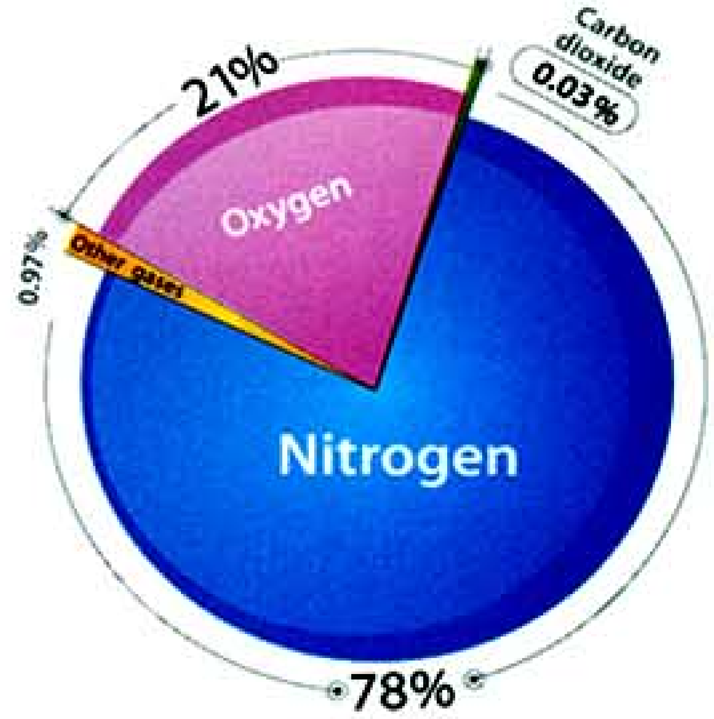


3. • Carbon dioxide (CO_2) is produced from burning of organic compounds such as:
wood - coal - oil (petroleum) - gasoline and tobacco (the matter used to make cigarettes).

Lesson 2

3. Percentage of carbon dioxide gas:

- CO_2 forms 0.03% of the air volume.
- CO_2 percentage in air is increasing.



4. Causes of the increase of CO_2 percentage:

1. The removal of forests leads to the increase in carbon dioxide percentage in air. G.R.
   As they absorb carbon dioxide needed to perform photosynthesis process.



2. The combustion of massive amount of fuels in factories and means of transportation.



G.R. Recently, it has been observed that the percentage of CO_2 in the atmosphere is rising.

This is due to burning of massive amounts of fuels in factories and means of transportation engines.

NOTE

P.O.C	Photosynthesis	Respiration
Gas produced	Oxygen gas	Carbon dioxide
Gas consumed	Carbon dioxide	Oxygen

5. Harms of the increase of CO_2 percentage:



1. Suffocation (difficulty in breathing) of living organisms.



2. Harms the earth's climate and causes a rise in the earth's temperature (global warming).



3. Melting snow on the top of mountains and the two poles causing the rising of sea level which may expose some coastal towns to the danger of sinking.

Check point 1 Complete the following sentences: *(Answer Guide: P.14)*

1. Carbon dioxide gas .... during the photosynthesis process and .... during the respiration process.
2. .... and .... cause increasing the percentage of carbon dioxide gas.
3. Harms of increasing the carbon dioxide percentage are .... and ....



Lesson 2

Activity — To detect carbon dioxide gas in exhaled air:

Materials: A test tube - clear limewater.

Steps	Illustration	Observation
Exhale through a straw into the tube containing clear limewater.		• Limewater turns milky (turbid).

Do you know?
To form limewater, add small amount of calcium hydroxide (soluble substance) to water then filtrate it and wait for a while then use it.

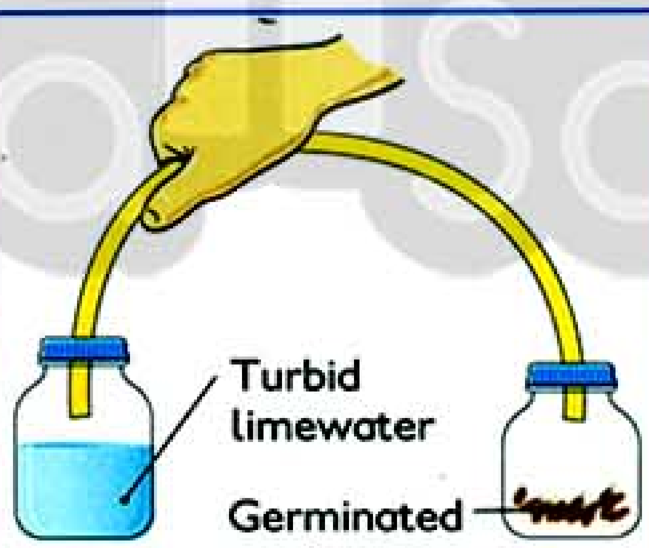
Conclusion

Exhaled air contains carbon dioxide gas.

N.B. To detect carbon dioxide gas, use clear limewater.

Activity — To prove that CO_2 gas is produced during respiration of plants:

Materials: Germinated seeds (beans or peas) - a jar - a tube - clear limewater.

Steps	Illustration	Observation
1. Put some germinated seeds in the jar as in the figure. 2. Place the tube in a beaker containing limewater. 3. Leave it for a while.		• Limewater turns milky (turbid).

Conclusion

Germinated seeds respire and release carbon dioxide that makes limewater turbid.

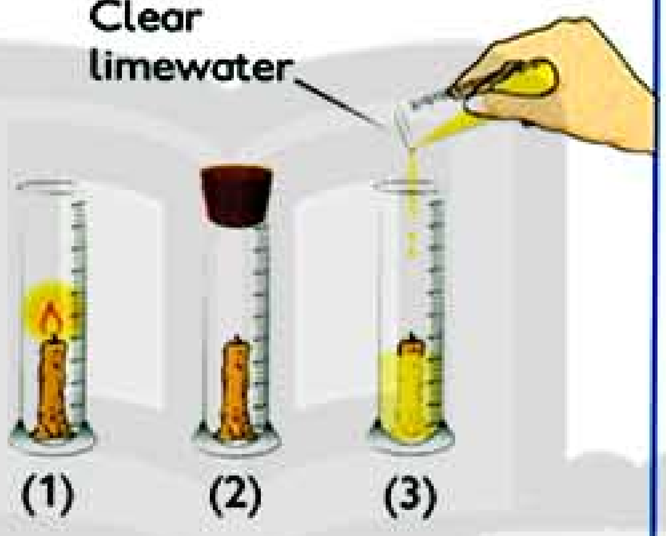
G.R. Clear limewater is turbid when carbon dioxide passes through it.

Due to the formation of calcium carbonate which is insoluble in water.

Activity

To detect the presence of carbon dioxide during burning of a candle:

Materials: A glass cylinder - a lighted candle - a glass cover - clear limewater.

Steps	Illustration	Observation
1 Put a lighted candle into a cylinder.		• After a while the candle is extinguished.
2 Cover the candle with the glass cover.		
3 Remove the cover and pour a little amount of clear limewater inside the cylinder.		• Limewater turns milky (turbid).

Conclusion

Carbon dioxide is produced from the combustion of organic substances such as wax.

Check point 2

Complete the following sentences: *(Answer Guide: P. 14)*

1. .... is used to detect the existence of carbon dioxide gas.

2. Lime water changes from .... to .... when carbon dioxide gas passes through it.



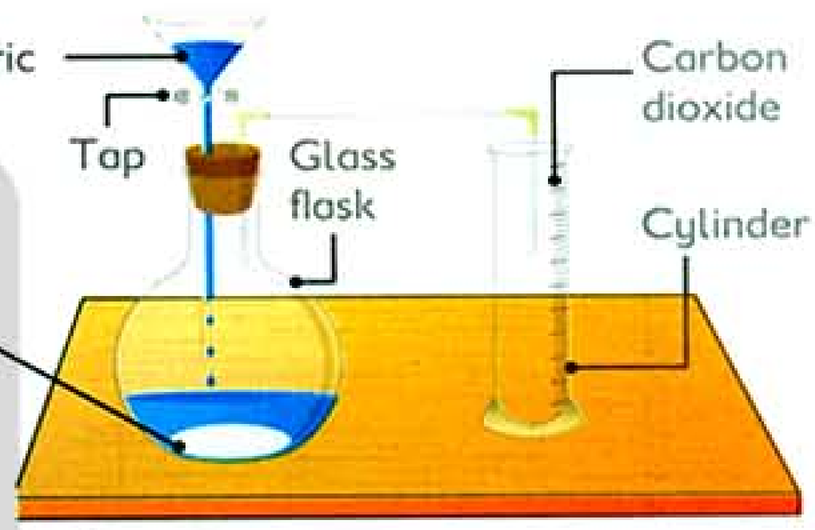
Lesson 2

6. Preparation of carbon dioxide gas in the lab:

Activity

To prepare carbon dioxide gas in the lab:

Materials: A flask - a cylinder - a funnel - dilute hydrochloric acid - calcium carbonate.

Steps	Illustration
1 Set up the apparatus as shown in the figure. 2 Pour a little dilute hydrochloric acid on calcium carbonate.	

Observation

- CO_2 gas bubbles evolved in the cylinder.
- Carbon dioxide gas is collected in the cylinder by upward displacement of air. **G.R.**

  Because it is heavier than air.

Conclusion

- CO_2 gas is prepared as a result of the reaction between hydrochloric acid with calcium carbonate.

NOTE
Carbon dioxide gas evolves when you open soft drinks.

G.R. Carbon dioxide gas is not collected by displacement of water as in the case of oxygen gas.

Because CO_2 gas easily dissolves in water.

Another way to prepare carbon dioxide gas:

Carbon dioxide gas evolves by squeezing a lemon or adding vinegar to a little amount of sodium bicarbonate.



Benchmark

Selected from Previous Exams

(Answer Guide: P. 14)



1. Write the scientific term for each of the following:

1. A gas in the atmosphere when its ratio increases in the air, it causes severe harm to the earth's climate. *(Qalubia 2016)* (..................)
2. The gas whose molecule consists of one carbon atom linked to two oxygen atoms. *(Cairo 2019)* (..................)
3. A substance becomes turbid if carbon dioxide gas passes over it. *(Cairo 2019)* (..................)

2. Choose the correct answer:

1. When the exhaled air passes through clear limewater, it becomes turbid forming a substance called .... *(Qena 2015)*
   - a. calcium carbonate
   - b. calcium oxide
   - c. calcium hydroxide
   - d. calcium chloride
2. Carbon dioxide gas evolves by adding dilute hydrochloric acid to .... *(Assiut 2017)*
   - a. calcium carbonate
   - b. calcium oxide
   - c. calcium hydroxide
   - d. calcium chloride

3. Complete the following sentence:

- Carbon dioxide can be prepared by adding .... to .... powder. *(Damietta 2019)*

4. Give a reason:

- The clear limewater becomes turbid when carbon dioxide gas passes through it. *(Giza 2019)*

....

5. What happens if ...?

1. The continuous increase in the ratio of CO_2 gas in the atmospheric air. *(Sharkia 2018)*

....

2. Adding a little amount of limewater in a jar that contains carbon dioxide. *(Cairo 2019)*

....

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Worksheet 11
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Lesson 2

7. Properties of carbon dioxide gas:

Activity Investigate the properties of carbon dioxide gas through the following experiments.

Steps	Observation	Illustration
1 Check the color and smell the odor of the gas.	• Carbon dioxide has no color and no odor.	• Carbon dioxide is colorless and odorless.
2 Turn a cylinder filled with CO_2 upside down on a lighted candle.	• The candle is extinguished in the presence of carbon dioxide gas. G.R. Because it does not burn and does not help in burning. 	• Carbon dioxide does not burn and does not help in burning. That is why it is used for extinguishing fires.
3 Insert a lighted magnesium ribbon in a cylinder filled with CO_2 using a combustion spoon.	• Magnesium ribbon keeps burning for a short time, then extinguishes forming white powder and black substance that deposits on the wall of the cylinder. 	• Magnesium oxide (with white color) is formed and carbon (coal) deposits on the wall of cylinder with black color.

Check point 3 Complete the following sentences:

(Answer Guide: P. 14)

1. Carbon dioxide gas is odorless, ... and ....
2. Carbon dioxide gas .... than air.
3. Carbon dioxide gas is collected by .... of air.



8. Importance and uses of carbon dioxide gas:

1



Refrigeration: **Carbon dioxide is used in making dry ice which is used in refrigeration through pressure and cooling processes.**

Carbon dioxide $\xrightarrow[\text{and cooling}]{\text{by pressure}}$ **Liquid** $\xrightarrow[\text{pressure}]{\text{by relieving}}$ **Dry ice**

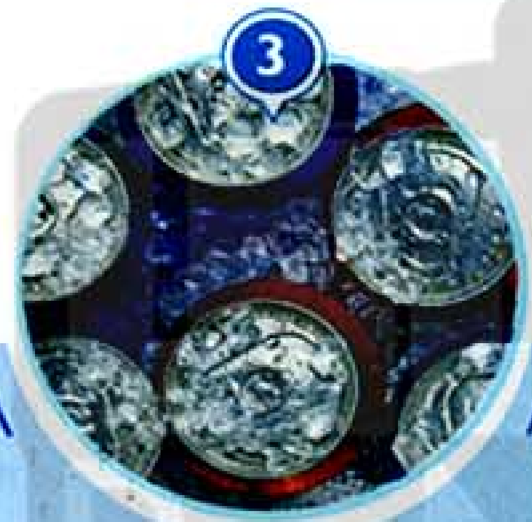
2



It is used in extinguishing fires. G.R.

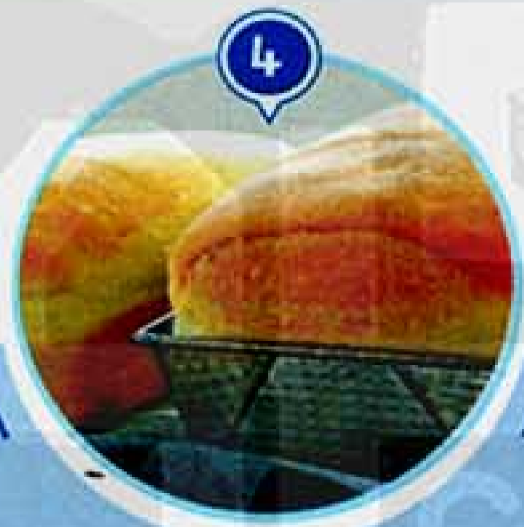
Because it does not burn and does not help in burning.

3



It is used to make soft drinks. (Drinking big quantities of soft drinks causes an increase in the ratio of CO_2 gas in blood which leads to not getting the oxygen needed for all vital processes **and causes Osteoporosis (bone disease).**

4



It is used to make bread bubbled (spongy) as yeast added to dough on making bread (fermentation). G.R.

To produce carbon dioxide gas which expands by heat making bread porous and tasty.

5



Carbon dioxide contributes in photosynthesis process in green plants leading to the production of food as well as the production of oxygen.

Enrichment information

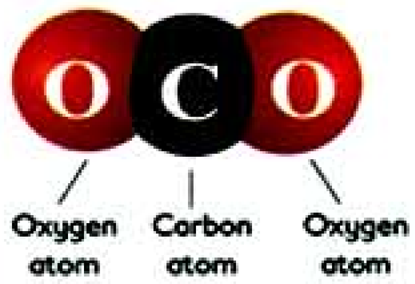
- **Scientists called soft drinks "the useless food".** G.R.
  Because they don't contain any nutrients except sugar.
- **Carbon dioxide is called the "silent killer".** G.R.
  Because we cannot see it, taste it or even smell it.

Lesson Overview

Summary

Carbon dioxide gas forms 0.03 % of the volume of the atmosphere.

Carbon dioxide gas



Structure

Oxygen atom + Carbon atom + Oxygen atom = Carbon dioxide

Sources

- Respiration
- Burning

Properties of carbon dioxide gas

- The magnesium ribbon keeps burning and turns into a magnesium oxide (with white color) and the carbon (coal) deposits on the wall of the cylinder with black color.
- It is colorless and odorless.
- It is heavier than air, so it is collected by displacing the air upwards and replacing it.
- It does not burn and does not help in burning, so it is used for extinguishing fires.
- It easily dissolves in water, so it is not collected by displacing water as in the case of oxygen.

Importance and uses of carbon dioxide gas

1. Making dry ice which is used in refrigeration.
2. Extinguishing fires.
3. Making bread porous and tasty.
3. Photosynthesis process of plants.
4. Making soft drinks.

Now, I am able to:

- Identify the structure and percentage of carbon dioxide gas.
- Mention the causes of increasing the carbon dioxide gas percentage and its harms.
- Identify different ways to prepare carbon dioxide gas.
- Prepare carbon dioxide gas at home by using simple materials.
- List the properties of carbon dioxide gas.
- Mention the uses of carbon dioxide gas.

Language Focus

deposits	رواسب
suffocation	اختناق
extinguish	تنطفئ
upward displacement	إزاحة علوية
tobacco	التبغ
osteoporosis	هشاشة عظام

References

Ministry of Education (MOE) Books

Egyptian Knowledge Bank

Al-Adwaa Application
- Al-Adwaa e-book
- Al-Adwaa Videos
- Al-Adwaa Question Bank



School Book Exercises on Lesson 2

Answer Guide: P. 15

1 What will happen to our lives on Earth if ...?

1. The percentage of carbon dioxide in the air increases. *(Sohag 2019)*

....

2. The percentage of carbon dioxide in the air decreases.

....

2 Complete the following sentences:

1. In photosynthesis process, the plant absorbs .... gas and produces .... gas, while in respiration process, ... gas in consumed and .... gas is produced. *(Cairo 2019)*
2. The true ratio (percentage) of carbon dioxide gas in the atmospheric air is .... and its symbol is .... *(Aswan 2018)*
3. Carbon dioxide gas is changed by .... and .... to liquid, then pressure is relieved composing .... which is used in refrigeration. *(Sohag 2019)*

3 Give reason for:

1. Carbon dioxide is used in extinguishing fires. *(Cairo 2019)*

....

2. Yeast is added to dough on making bread. *(Qalubia 2016)*

....

3. Clear limewater becomes turbid when carbon dioxide passes through it. *(Giza 2019)*

....

4. The environment suffers from increasing the ratio of carbon dioxide gas in recent years. *(Cairo 2017)*

....

Al-Adwaa Exercises on Lesson 2

Answer Guide: P. 15

Carbon dioxide gas

(structure - sources - harms and preparation)

1 Choose the correct answer:

1. The chemical structure of carbon dioxide gas is ....
   a. O_2 b. H_2O c. CO d. CO_2
2. When the exhaled gas passes through clear limewater, it becomes turbid forming a substance called .... *(Aswan 2016)*
   a. calcium carbonate b. calcium oxide
   c. calcium hydroxide d. carbon dioxide
3. Clear limewater is calcium .... *(Qalubia 2019)*
   a. carbonate b. hydroxide c. oxide d. metal
4. Photosynthesis process in plants depends on the presence of ....
   a. oxygen b. ozone c. carbon dioxide d. nitrogen
   (Menofia 2014)
5. Carbon dioxide is produced from ....
   a. photosynthesis b. respiration c. burning d. (b) and (c)
6. .... gas is formed when burning cigarettes.
   a. Ozone b. Nitrogen c. Oxygen d. Carbon dioxide
7. .... happens when carbon dioxide percentage increases, causing the earth's temperature to increase.
   a. Fermentation b. Oxidation c. Global warming d. Combustion
8. Carbon dioxide turns limewater ....
   a. red b. green c. milky d. orange
9. .... gas is prepared by adding dilute hydrochloric acid to calcium carbonate. *(Assiut 2017)*
   a. Oxygen b. Nitrogen c. Carbon dioxide d. Neon
10. Carbon dioxide gas is collected by the .... *(Alex. 2019)*
    a. upward displacement of air b. upward displacement of water
    c. downward displacement of air d. downward displacement of water
11. All the following are organic compounds except ....
    a. manganese dioxide b. coal
    c. wood d. gasoline
12. When adding lemon to sodium bicarbonate, ... evolves.
    a. ozone b. nitrogen c. oxygen d. carbon dioxide

Lesson 2

2 Complete the following sentences:

1. Carbon dioxide molecule consists of one .... atom linked with two .... atoms. *(Cairo 2017)*
2. Carbon dioxide is emitted as a result of the combustion of .... substances such as coal, ..., ... and gasoline.
3. Photosynthesis process in the plant depends on the presence of .... gas. *(Sohag 2018)*
4. Exhaled air contains a large amount of .... gas that makes .... turbid. *(Cairo 2012)*
5. Carbon dioxide gas is prepared in the laboratory by dropping .... over .... *(Damietta 2019)*
6. Carbon dioxide gas is collected by the .... displacement of .... as it is .... than air. *(Ismailia 2013)*
7. Carbon dioxide gas is not collected by .... displacement of water because it is .... in water.
8. The removal of forests leads to the increase in the ratio of .... gas in air.
9. Increasing the level of carbon dioxide leads to .... of living organisms.
10. .... is a chemical substance used to detect the presence of carbon dioxide gas in air.
11. Lime water turns into milky in the presence of .... due to the formation of .... which is insoluble in water.
12. Oxygen is produced from .... process, while carbon dioxide is produced from .... process. *(Fayoum 2013)*

3 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. Carbon dioxide molecule consists of one carbon atom linked with two oxygen atoms. *(Kafr El-Sheikh 2012)* (   )
2. Limewater is used to detect the presence of carbon dioxide gas. *(Qena 2014)* (   )
3. Carbon dioxide is collected by the downward displacement of air. (   )
4. The increase of CO_2 percentage in air causes suffocation. (   )
5. Photosynthesis process in the plant depends on the presence of carbon dioxide. *(Aswan 2014)* (   )
6. Carbon dioxide makes limewater turbid. *(Qena 2014)* (   )

7. The increase of oxygen gas in air causes global warming phenomenon. ( )
8. When adding lemon juice to sodium bicarbonate, oxygen gas is produced. ( )

4 Write the scientific term for each of the following:

1. The gas whose molecule consists of one carbon atom linked with two oxygen atoms. *(Cairo 2019)* (..........)
2. The gas that raises the temperature of the earth when it's percentage increases in air. *(Ismailia 2019)* (..........)
3. The phenomenon that happens when carbon dioxide level increases in the atmosphere and increases the earth's temperature. (..........)
4. The gas produced from the combustion of an organic substance. *(Giza 2019)* (..........)
5. The process that consumes oxygen and produces carbon dioxide. (..........)
6. The process that consumes carbon dioxide and releases oxygen. (..........)
7. The gas that turns limewater milky (turbid). *(South Sinai 2019)* (..........)
8. The chemical substance added to calcium carbonate during the preparation of carbon dioxide. (..........)
9. The chemical substance which is used to detect the presence of carbon dioxide. *(Sohag 2018)* (..........)
10. The method that is used to collect carbon dioxide during its preparation. (..........)
11. A gas that is produced as a result of the reaction between lemon juice and sodium bicarbonate. (..........)

5 Correct the underlined words:

1. Carbon dioxide molecule consists of two carbon atoms linked to one nitrogen atom. (..........)
2. Carbon dioxide is produced from the reaction of dilute hydrochloric acid with manganese dioxide. *(Kafr El-Sheikh 2017)* (..........)
3. When the exhaled air passes through clear limewater, it forms calcium oxide. *(Ismailia 2019)* (..........)

4. The removal of forests leads to decreasing the level of carbon dioxide. (..................)

5. Carbon dioxide contributes in respiration process in green plants to produce food and oxygen. (..................)

6 Give a reason for each of the following:

1. The appearance of global warming phenomenon.
....
2. Cutting down forests leads to the increase of carbon dioxide percentage in nature.
....
3. Clear limewater is used to detect the presence of carbon dioxide. *(Giza 2018)*
....
4. Carbon dioxide is not collected by the displacement of water downward. *(Alex. 2018)*
....
5. Carbon dioxide is collected by the upward displacement of air. *(Cairo 2016)*
....

7 What happens if ...?

1. Carbon dioxide level increases in the atmosphere. *(South Sinai 2019)*
....
2. Cutting down forests increases.
....
3. You blow in a jar containing limewater. *(Cairo 2013)*
....
4. Adding lemon juice to sodium bicarbonate.
....
5. Adding dilute hydrochloric acid to calcium carbonate. *(Dakahlia 2016)*
....

8 Compare between respiration and photosynthesis: *(Qalubia 2014)*

Points of comparison	Respiration	Photosynthesis
1. Gas consumed	....	....
2. Gas produced	....	....

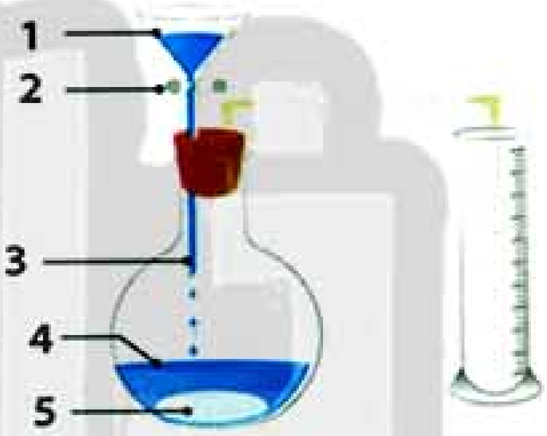
9 Write short notes on:

1. Sources of carbon dioxide gas.
....

2. Importance of clear limewater. *(Sohag 2018)*
....

10 Answer the following:

a. Look at the opposite apparatus which is used in preparing carbon dioxide in the lab, then answer the questions below:



1. Write the labels.
   1. .... 2. .... 3. ....
   4. .... 5. ....
2. How is the gas collected?
....
3. What happens if we put limewater in a cylinder containing carbon dioxide? *(Giza 2014)*
....

b. What are the uses and importance of carbon dioxide for all green plants? *(Sohag 2011)*
....

c. Mention the function of dry ice. *(Qalubia 2016)*
....

11 Show by carrying out an activity how to:

1. Prepare carbon dioxide in the lab.
2. Prove that the exhaled air contains carbon dioxide gas.
3. Prove that germinated seeds respire.

Lesson 2

Properties and importance of carbon dioxide gas

1 Choose the correct answer:

1. We can extinguish fires using .... gas. *(Port Said 2012)*
   a. carbon dioxide b. oxygen c. nitrogen d. hydrogen
2. Carbon dioxide gas is .... than air.
   a. lighter b. heavier c. softer d. no correct answer
3. Carbon dioxide is used in .... *(Port Said 2013)*
   a. making dry ice b. making soft drinks c. extinguishing fires d. (a), (b) and (c)
4. When a glowing magnesium ribbon is inserted in a cylinder containing carbon dioxide gas, ... element deposits on the wall of the cylinder. *(Cairo 2019)*
   a. magnesium b. nitrogen c. carbon d. oxygen
5. Carbon dioxide .... dissolves in water.
   a. scarcely b. easily c. never d. extremely
6. When opening soft drinks, ... evolves.
   a. ozone b. nitrogen c. oxygen d. carbon dioxide
7. Carbon dioxide is used in .... because it does not help in burning.
   a. making bread b. extinguishing fires
   c. fermentation d. soft drinks

2 Complete the following sentences:

1. Carbon dioxide gas is used to extinguish fires as it does not .... and does not help in burning.
2. Among the properties of carbon dioxide are .... and ....
3. .... gas is used in making soft drinks. *(Aswan 2013)*
4. Yeast is added to bread as it produces .... which makes the bread .... and ....
5. Carbon dioxide gas converts into liquid by .... and .... and by relieving pressure converts into dry ice. *(Sohag 2019)*
6. Solid carbon dioxide is called .... and it is used in .... *(Beheira 2014)*
7. Yeast produces carbon dioxide gas by .... process.
8. Magnesium reacts with carbon dioxide forming a white powder of .... and a black powder of ....

3 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. Nitrogen is used in extinguishing fires. ( )
2. Carbon dioxide does not burn, but it helps in burning. ( )
3. Among the characteristics of oxygen gas is that it is a colorless and odorless gas and it easily dissolves in water. ( )
4. Yeast is added to dough to produce carbon dioxide gas. ( )
5. Fermentation is a process done by soil bacteria. ( )
6. Carbon dioxide is used to make dry ice and soft drinks. *(Aswan 2016)* ( )
7. Dry ice is used as a cooling substance. ( )
8. Exhaled air contains a large amount of carbon dioxide gas. ( )
9. Air is heavier than carbon dioxide gas. ( )
10. Carbon dioxide scarcely dissolves in water. ( )

4 Write the scientific term for each of the following:

1. Something added to dough to produce carbon dioxide during fermentation. (..........)
2. The gas that is used in making soft drinks and dry ice. *(Red Sea 2013)* (..........)

5 Correct the underlined words:

1. Carbon dioxide dissolves <u>scarcely</u> in water. (..........)
2. <u>Ozone</u> gas is used in putting out fires. *(Sharkia 2014)* (..........)
3. The magnesium ribbon keeps burning and turns into <u>yellow</u> color in the cylinder which contains carbon dioxide gas. *(Ismailia 2019)* (..........)
4. A <u>black precipitate</u> is formed when carbon dioxide passes through clear limewater. *(Dakahlia 2014)* (..........)
5. When a lighted magnesium ribbon is inserted in a cylinder filled with <u>oxygen</u>, a black substance deposits on the wall of the cylinder. *(Gharbia 2016)* (..........)

Lesson 2

6 Give a reason for each of the following:

1. Carbon dioxide gas is used in putting out fires. (Cairo 2019)

....

2. Burning of a magnesium ribbon in the presence of carbon dioxide produces white and black substances.

....

3. We use yeast in the bread industry. (Port Said 2019)

....

4. Carbon dioxide has great importance for the continuity of life on the earth. (Beni Suef 2014)

....

7 What happens if ...?

1. A cylinder filled with carbon dioxide is turned upside down on a lighted candle. (Qalubia 2011)

....

2. A lighted magnesium ribbon is inserted in a cylinder filled with CO_2. (Sharkia 2013)

....

3. Yeast is added to dough of bread. (Beheira 2017)

....

4. Drinking big quantities of soft drinks. (Qena 2019)

....

8 Write short notes on:

1. Properties of carbon dioxide gas.

....

2. Importance of carbon dioxide gas. (Cairo 2012)

....

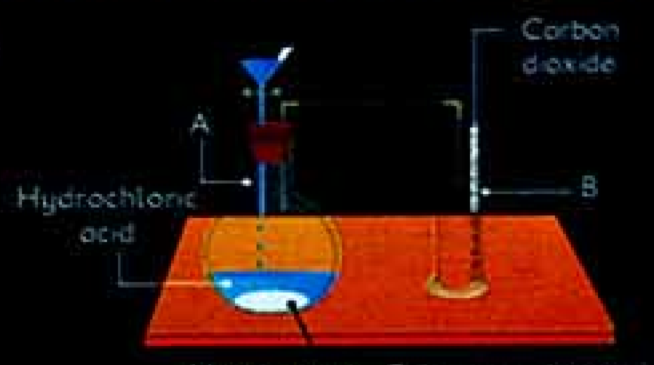
9 Show by carrying out an activity how to:

Prove that carbon dioxide doesn't burn and doesn't help in burning.

TIMSS Like Questions 2 on Lesson

Answer Guide: P. 16

1. Carbon dioxide can be prepared in the laboratory using the apparatus shown below.



Marble chips (Calcium carbonate)

(a) State the names of the pieces of the apparatus labeled A and B.

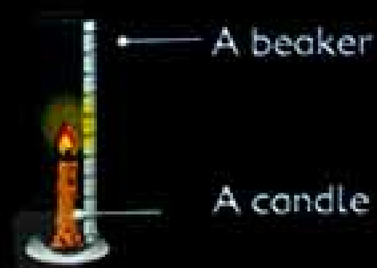
A. ....

B. ....

(b) Complete the word equation for this reaction.

Calcium carbonate + hydrochloric acid → .... + carbon dioxide + ...

(c) A burning candle is lowered into a beaker of carbon dioxide.



(i) The flame goes out. Explain why the flame goes out.

....

(ii) After 20 seconds, the candle is removed and relit.

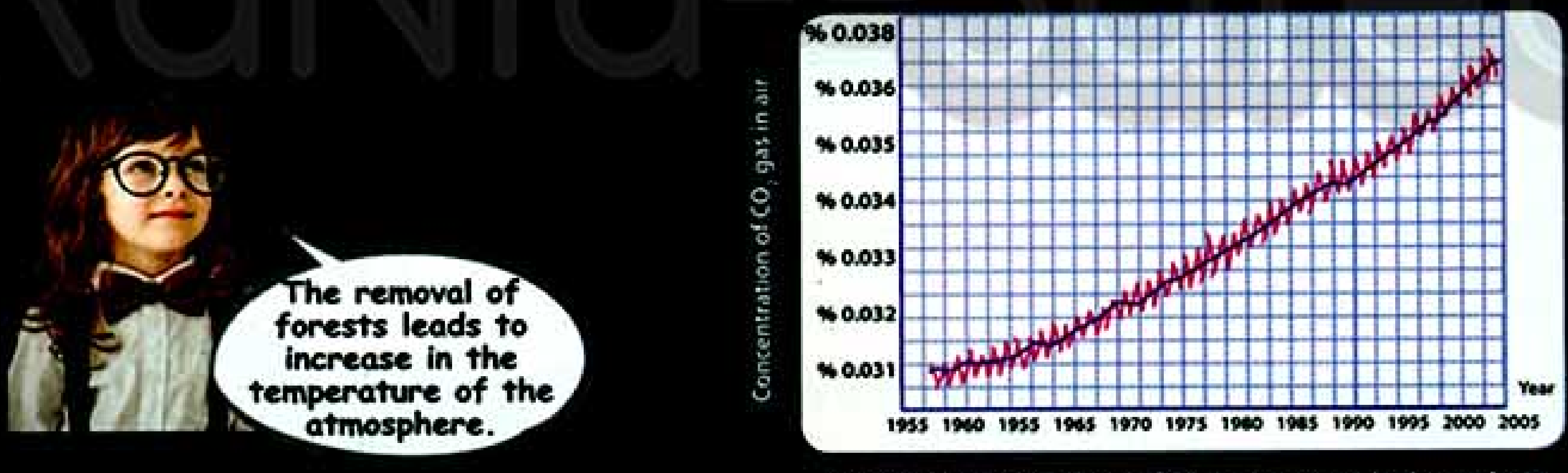
It is then lowered into the same beaker again.

The flame goes out again.

What does this tell you about the density of carbon dioxide compared to air?

....

2. Shaimaa made a prediction about the atmosphere:



Rising in the concentration of CO_2 in the atmospheric envelope

1. Does the information in the diagram support her prediction?

....

2. Explain your answer.

....

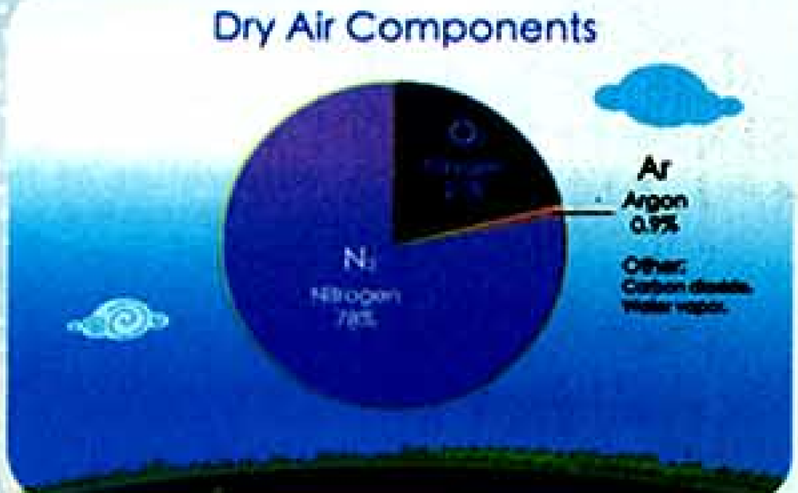
3. Write a research about the global warming phenomenon.

LESSON 3 Nitrogen

Brain Gym

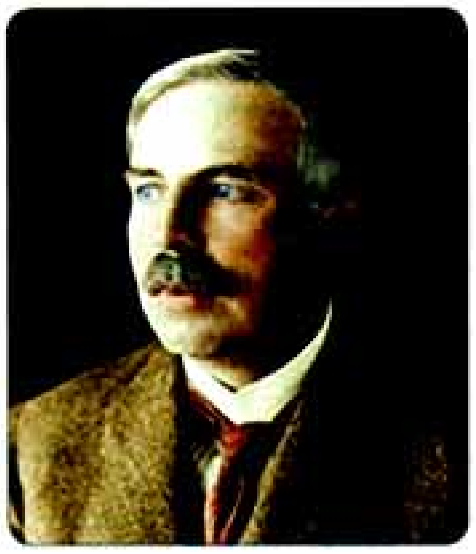
Look at the following graph, then answer the following questions:

- .... is the most abundant gas in the atmosphere.
- .... is the percentage of gas which helps in photosynthesis process.
- .... is a gas helps in burning but doesn't burn.



In this lesson, you will learn more about nitrogen gas and its importance.

Nitrogen gas



- Nitrogen is essential for all living organisms. G.R.

  As it is the main component of living organism's protein.
- It was discovered in 1772 by a New Zealander scientist called Daniel Rutherford.
- Nitrogen is colorless, tasteless and odorless.
- Nitrogen does not burn and does not help in burning.
- Nitrogen is scarcely dissolves in water.

G.R.

1. Nitrogen is the most abundant gas in the atmosphere.

Because it forms 78% of the atmosphere volume.

2. It is called "azote" which means lifeless.

Because it does not help in burning and is not included in the process of respiration.

1. Chemical structure of nitrogen gas:



1. It consists of two atoms of nitrogen.
2. It is a chemical element found in nature in the form of a gas and we refer to it by the formula N_2.

Check point 1

A) Complete the following sentences: *(Answer Guide: P. 17)*

1. Nitrogen is a chemical element found in nature in a .... state.
2. Nitrogen molecule consists of .... nitrogen atoms and its symbol is ....



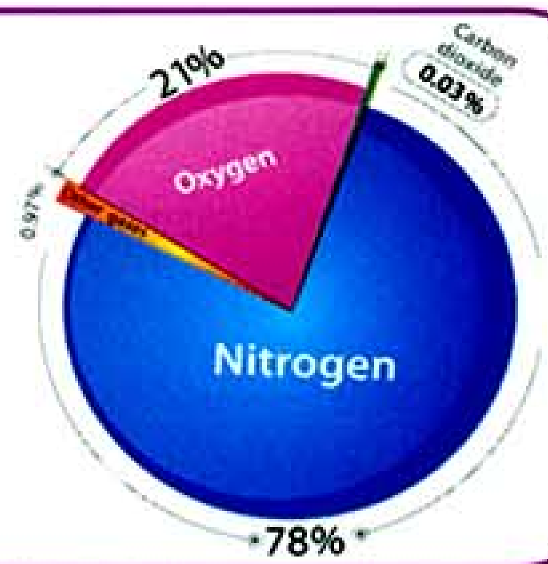
B) Write the scientific term for each of the following:

1. The most abundant gas in the atmosphere. (......................)
2. The scientist who discovered nitrogen gas. (......................)

Lesson 3

2. Existence of nitrogen gas:

1. Air is the main source of nitrogen. G.R.
It represents 78% of the earth's atmosphere which equals ($\frac{4}{5}$) of the volume of air.



2. All living organisms need nitrogen to live. G.R.
Because it takes part in the composition of all living organisms' tissues.
(As nitrogen plays the most important role in the composition of proteins).



3. Oxygen reacts with nitrogen during lightning forming compounds known as nitrogen oxides that reach soil with acidic rains.



4. Nitrogen gas is absorbed by a special type of bacteria (nodular bacteria) that live on the roots of legumes such as (clover, peas and soybeans) to build proteins.



3. Importance and uses of nitrogen gas

1. It is used in filling car tires.
   G.R. For the relative constancy of its volume at the change of temperature.



2. It contributes in composing gunpowder.



3. It is used to make stainless steel, so it does not rust.



4. Small amounts of nitrogen are used to fill some types of lamps.
   G.R. Because it is an inactive gas.



5. It is used in manufacturing of (ammonia and ammonium nitrates).
   G.R. To produce fertilizers.



Check point 2 Write the scientific term for each of the following:

(Answer Guide: P. 17)

1. The gas used in filling car tires. (..............................)
2. The gas called azote which means a lifeless gas. (..............................)
3. The gas that contributes in the manufacturing of gunpowder and ammonium nitrates that are used in making fertilizers. (..............................)



Lesson 3

A comparison between (Oxygen gas - Carbon dioxide gas and Nitrogen gas)

P.O.C.	Oxygen	Carbon dioxide	Nitrogen
1. Source	• Photosynthesis process.	• Respiration process.	• Air
2. Its percentage	21%	0.03%	78%
3. The chemical materials used in lab preparation	• Adding hydrogen peroxide to manganese dioxide.	• Adding dilute hydrochloric acid to calcium carbonate.	
4. Physical properties	• Colorless, tasteless and odorless.	• Colorless and odorless.	• Colorless, tasteless and odorless
5. Weight	• Heavier than air.	• Heavier than air.	
6. Burning	• It does not burn, but it helps in burning.	• It does not burn and does not help in burning.	• It does not burn and does not help in burning.
7. Reaction with magnesium	• The lighted magnesium ribbon gives a white powder of magnesium oxide.	• The lighted magnesium ribbon gives white powder of magnesium oxide and black carbon deposits on the wall of the cylinder.	
8. Dissolving in water	• It scarcely dissolves in water.	• It easily dissolves in water.	• It scarcely dissolves in water.
9. Effect on limewater	• No effect.	• It turns limewater turbid (milky).	• No effect.
10. Uses	• Oxyacetylene flame used in cutting and welding of metals.	• Fire extinguishers.	• Filling car tires and some types of lamps

Benchmark

Selected from Previous Exams

(Answer Guide: P. 17)

1. Write the scientific term for each of the following:

1. A gas called azote which means a lifeless gas. *(Cairo 2019)* (..........)
2. It forms about 78% of the volume of atmosphere. *(Kafr El-Sheikh 2016)* (..........)
3. A chemical substance produced from the combination of nitrogen gas with oxygen during lightning. *(Qena 2018)* (..........)
4. A type of plants that produces protein from nitrogen by the help of one type of soil bacteria. *(Giza 2016)* (..........)
5. The main source for preparing nitrogen. *(Qena 2016)* (..........)

2. Give a reason for each of the following:

- Nitrogen is very important in the human's life. *(Gharbia 2017)*

....

3. What is the importance or the function of ...?

- Nodular bacteria that live in roots of leguminous plants. *(Giza 2015)*

....

4. Choose the correct answer:

1. The most abundant gas in the atmosphere is .... *(Qalubia 2015)*

   a. oxygen b. nitrogen c. chlorine d. carbon dioxide

2. Nitrogen molecule consists of .... nitrogen atom(s). *(Ismailia 2015)*

   a. one b. two c. three d. four

3. Nitrogen oxides are formed in the atmosphere during .... *(Suez 2015)*

   a. thunder b. heat c. lightning d. wind

TRY TO SOLVE
Worksheet 12
Page 41

Lesson Overview

Summary

Nitrogen is the most abundant gas in the atmosphere, where it forms 78% of the volume of the atmosphere about ($\frac{4}{5}$) of the air volume.

Nitrogen gas

Structure

Nitrogen atom + Nitrogen atom = N_2

Sources

The main source of the nitrogen gas is the air.

Properties of nitrogen gas

- It does not burn and does not help in burning.
- It is colorless and odorless.
- It scarcely dissolves in water.

Importance and uses of nitrogen gas

1. It is used in filling car tires.
2. It contributes in composing gunpowder and ammonium nitrates, which are included in the composition of soil fertilizers.
3. It is used in manufacturing of ammonia.
4. It is used to make stainless steel.
5. Small amounts of nitrogen are used to fill some types of lamps.

Now, I am able to:

- Identify the structure and percentage of oxygen gas.
- List the properties of nitrogen gas.
- Mention the uses of nitrogen gas.

Language Focus

abundant	وفير
clover	برسيم
fertilizers	أسمدة
gunpowder	بارود
inactive gas	غاز خامل
lifeless	عديم الحياة
lightning	البرق
legumes	البقوليات
relative constancy	الثبات النسبى
volcanic eruption	ثوران بركانى

References

Ministry of Education (MOE) Books

Egyptian Knowledge Bank

Al-Adwaa Application
- Al-Adwaa e-book
- Al-Adwaa Videos
- Al-Adwaa Question Bank

School Book Exercises on Lesson 3

Answer Guide: P. 17

1 Write (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

1. Legumes such as clover benefit from the nitrogen in air. *(Assuit 2014)* (   )
2. Nitrogen gas is also called azote which means a life gas. *(Cairo 2019)* (   )
3. Oxygen gas is colorless, tasteless, odorless and does not help in burning. (   )

2 Choose the right answer:

1. Nitrogen gas percentage is .... of the air.
   a. 21% b. 78% c. 12% d. 1%
2. Nitrogen is the most important part of ....
   a. proteins b. corbohydrates c. fats d. water
3. From the properties of nitrogen is ....
   a. it burns
   b. it enters the structure of corbohydrates
   c. it enters the process of breathing
   d. it doesn't help in burning

Al-Adwaa Exercises on Lesson 3

Answer Guide: P. 17

Nitrogen gas (structure and existence)

1 Choose the correct answer:

1. The molecule of nitrogen gas consists of .... of nitrogen. *(Sohag 2018)*
   a. one atom b. two atoms c. three atoms d. four atoms
2. Nitrogen represents .... of the Earth's atmosphere.
   a. 87% b. 21% c. 0.03% d. 78%
3. Nitrogen is considered the main component of ....
   a. carbohydrates b. fats c. proteins d. all the previous
4. Nitrogen combines with oxygen giving ....
   a. nitrates b. nitrogen oxide c. ammonia d. all the previous
5. The scientist who discovered nitrogen gas was ....
   a. Celsius b. Priestley c. Rutherford d. Lavoisier
6. The main source of nitrogen is .... *(Giza 2019)*
   a. air b. water c. carbon dioxide d. (a) and (b)
7. Legumes such as peas produce proteins by the help of .... in their roots.
   a. ammonia b. bacteria c. carbon dioxide d. (a) and (b)
8. Which of the following gases has a great percentage in the atmospheric air? – .... *(Assiut 2014)*
   a. Oxygen b. Nitrogen
   c. Carbon dioxide d. Water vapor
9. During lightning, ... is formed.
   a. nitrogen oxide b. copper oxide
   c. carbon dioxide d. magnesium oxide

2 Complete the following sentences:

1. Nitrogen is a chemical element found in nature in a .... state. *(Dakahlia 2013)*
2. Nitrogen molecule consists of .... nitrogen atoms and its symbol is ....
3. .... is the main component of protein substances. *(Dakahlia 2013)*
4. Legumes form proteins with the help of a certain type of .... that live in ....
5. Nitrogen is an essential element for the tissues of living organisms as it forms ....
6. Nitrogen forms ....% of the volume of the atmosphere and contributes in the composition of living organisms .... *(Matrouh 2013)*
7. Nitrogen gas is called "azote" because it .... *(Red Sea 2011)*
8. Nitrogen oxide exists in air and reaches soil with ....
9. Nitrogen oxide is formed in the atmosphere during ....

3 Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:

1. The main source of nitrogen gas is the atmospheric air. (   )
2. Nitrogen gas is composed of two hydrogen atoms. (   )
3. Oxygen represents 78% of the air volume. *(Cairo 2017)* (   )
4. Nitrogen gas represents 21% of the volume of the atmospheric air. *(Menofia 2013)* (   )
5. Nitrogen gas is the most abundant gas in air. (   )
6. Nitrogen contributes in the composition of all living organisms tissues. (   )
7. Nitrogen is called "azote" which means the gas of life. *(Suez 2017)* (   )
8. Nodular bacteria fix the oxygen in the legumes such as beans and clover. (   )

4 Write the scientific term for each of the following:

1. The most abundant gas in the atmospheric air. (..............................)
2. The gas that composes the protein substance that builds up our bodies. *(Dakahlia 2019)* (..............................)
3. The gas that is called azote which means a lifeless gas. *(Alex. 2012)* (..............................)
4. It forms about 78% of the volume of the atmosphere. *(Gharbia 2017)* (..............................)
5. The scientist who discovered N_2 gas. *(Beheira 2018)* (..............................)
6. The chemical substances formed in the atmosphere as a result of combination of oxygen and nitrogen during lightning. *(Giza 2018)* (..............................)

5 Correct the underlined words:

1. The main source of nitrogen is water. *(Aswan 2011)* (..............................)
2. Oxygen contributes in the composition of all living organisms tissues. *(Port Said 2012)* (..............................)
3. Nitrogen is called "azote" which means a life gas. *(Cairo 2014)* (..............................)
4. Soil bacteria in legumes plants fix oxygen from air. *(Damietta 2016)* (..............................)

6 Give a reason for each of the following:

1. Nitrogen is called "azote" which means lifeless. *(Qena 2014)*

   ....

2. Nitrogen is very important to legumes.

   ....

3. Nitrogen is very important in the human life.

   ....

7 What happens if ...?

1. Nitrogen gas is not present in the atmosphere.

   ....

2. Oxygen reacts with nitrogen during lightning. *(Dakahlia 2017)*

   ....

3. Getting rid of soil bacteria.

   ....

8 What is the importance or the function of ...?

Nodular bacteria that live in roots of leguminous plants. *(Giza 2015)*

....

Lesson 3

Importance and uses of Nitrogen Gas

1 Choose the correct answer:

1. The gas which is used to fill some types of lamps is .... *(Qena 2017)*
   a. oxygen b. nitrogen c. hydrogen d. carbon dioxide
2. .... is a gas that is used in filling car tires. *(Damietta 2014)*
   a. Oxygen b. Nitrogen c. Carbon dioxide d. Hydrogen
3. The gas which is used in the manufacturing of ammonia is .... *(Aswan 2014)*
   a. nitrogen b. oxygen c. carbon dioxide d. hydrogen
4. .... is the gas that contributes in composing gunpowder. *(Suez 2014)*
   a. Oxygen b. Carbon dioxide c. Nitrogen d. Argon
5. Nitrogen is used in the manufacturing of .... *(Cairo 2014)*
   a. soft drinks b. dry ice c. fertilizers d. fire extinguishers
6. Nitrogen is used to make .... *(Fayoum 2014)*
   a. thermometers b. steel
   c. soft drinks d. all the previous answers
7. Nitrogen is used to make .... which doesn't rust. *(Sohag 2018)*
   a. iron b. stainless steel c. aluminum d. copper
8. Fertilizers contain .... *(Giza 2019)*
   a. ozone b. ammonia
   c. ammonia and carbon dioxide d. magnesium oxide

2 Complete the following sentences:

1. .... is used in the manufacturing of stainless steel. *(Red Sea 2013)*
2. Nitrogen is used in filling .... and ....
3. Nitrogen gas is used in the manufacturing of .... because it is an inactive gas and it does not rust.
4. As the volume of nitrogen gas does not change on changing temperature, it is used in ....

3 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. Nitrogen gas is colorless, tasteless, odorless and doesn't help in burning. ( )
2. Nitrogen gas dissolves easily in water. ( )
3. Car tires are filled with nitrogen to keep its volume constant at different temperature. ( )

4 Write the scientific term for each of the following:

1. The gas that is used in filling car tires. (........................)
2. The gas that is used in making stainless steel. (........................)
3. The gas that is used in the ammonia industry to produce fertilizers. (........................)
4. The gas that is used in filling some types of lamps. (........................)

5 Correct the underlined words:

1. Carbon dioxide is used in the manufacturing of gunpowder. (........................)
2. Small amounts of oxygen gas are used to fill some types of lamps. (........................)
3. Carbon dioxide is used in filling car tires. (........................)
4. Car tires are filled with oxygen which keeps its volume constant at different temperatures. (........................)
5. Oxygen is commercially used in the manufacturing of ammonia to produce fertilizers. (........................)

6 Give a reason for each of the following:

- Nitrogen is recently used in filling car tires.

....

7 Mention the name of the gas used in:

1. Manufacturing of fire extinguishers. (........................)
2. Cutting and welding of metals. (........................)
3. The composition of the ozone layer. (........................)
4. Photosynthesis process. (........................)
5. The respiration and food combustion. (........................)
6. Baking of bread and cakes. (........................)
7. Refrigeration. (........................)

Lesson 3

8. Manufacturing of soft drinks. (..............................)
9. The composition of water. (..............................)
10. Diving and climbing of mountains. (..............................)
11. Surgeries. (..............................)
12. Providing proteins to plants. (..............................)
13. Protecting the earth from ultraviolet radiations of the sun. (..............................)

8 Compare between ...:

1. Number of atoms in each of nitrogen molecule and carbon dioxide molecule.

(Kafr El-Sheikh 2014)

P.O.C.	Nitrogen	Carbon dioxide
Number of atoms	....	....

2. Oxygen gas and nitrogen gas (with regard to combustion and percentage in the atmosphere). *(Alex. 2014)*

P.O.C.	Oxygen	Nitrogen
Combustion	....	....
Percentage in the atmosphere	....	....

9 Write short notes on ...:

Importance of nitrogen gas. *(Cairo 2012)*

....

TIMSS Like Questions 3 on Lesson

Answer Guide: P. 18

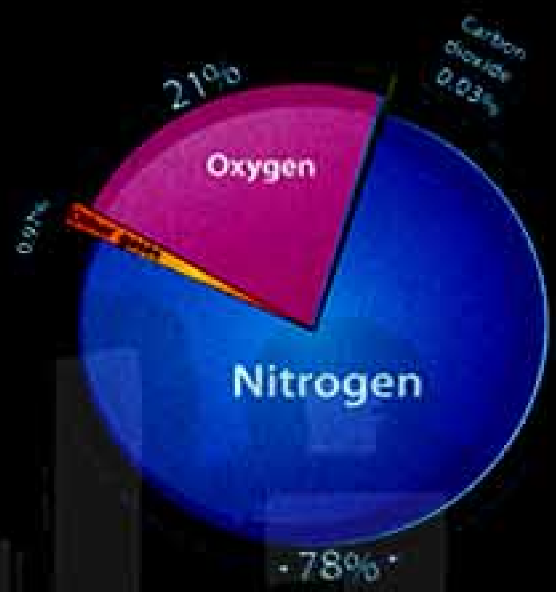
1. Clean air is a mixture of gases.

- State the composition of clean air. In your answer, include:
  - The names and percentages of the two main gases present in clean air.

....

....

2. The pie chart shows the composition of air.



- (i) What is the percentage of nitrogen in air?

....

....

(ii) Apart from nitrogen and oxygen, state the names of two gases present in unpolluted air.

.... and ....

3. The table below shows the properties of two materials:

Properties of material 1	Properties of material 2
- It makes clear limewater turbid. - The increase of its percentage causes global warming. - It consists of 2 oxygen atoms and one carbon atom. - Its percentage is 0.03%	- It is the most important part of proteins. - It is the most abundant gas in the atmosphere.

- Which statment about material 1 and 2 is the most likely to be correct?

a. Material 1 is carbon dioxide gas, and material 2 is oxygen gas.

b. Material 1 is oxygen gas, and material 2 is nitrogen gas.

c. Material 1 is carbon dioxide gas, and material 2 is nitrogen gas.

d. Material 1 is nitrogen gas, and material 2 is carbon dioxide gas.

4. What would happen if you put your hand in the liquid nitrogen indicating the nitrogen temperature?

Unit 3 Think & Create



Assignment No. (1)

"School broadcasting"

- Prepare an essay about the components and the importance of the atmosphere surrounding the earth and the importance of each gas in nature.

Assignment No. (2)

"Interesting topic"

- Do you know that you can fix a nail in a piece of wood by a banana if quickly immersed in liquefied nitrogen? Use the internet sites to search about the usage of liquefied nitrogen in different fields.





Assignment No. (3)

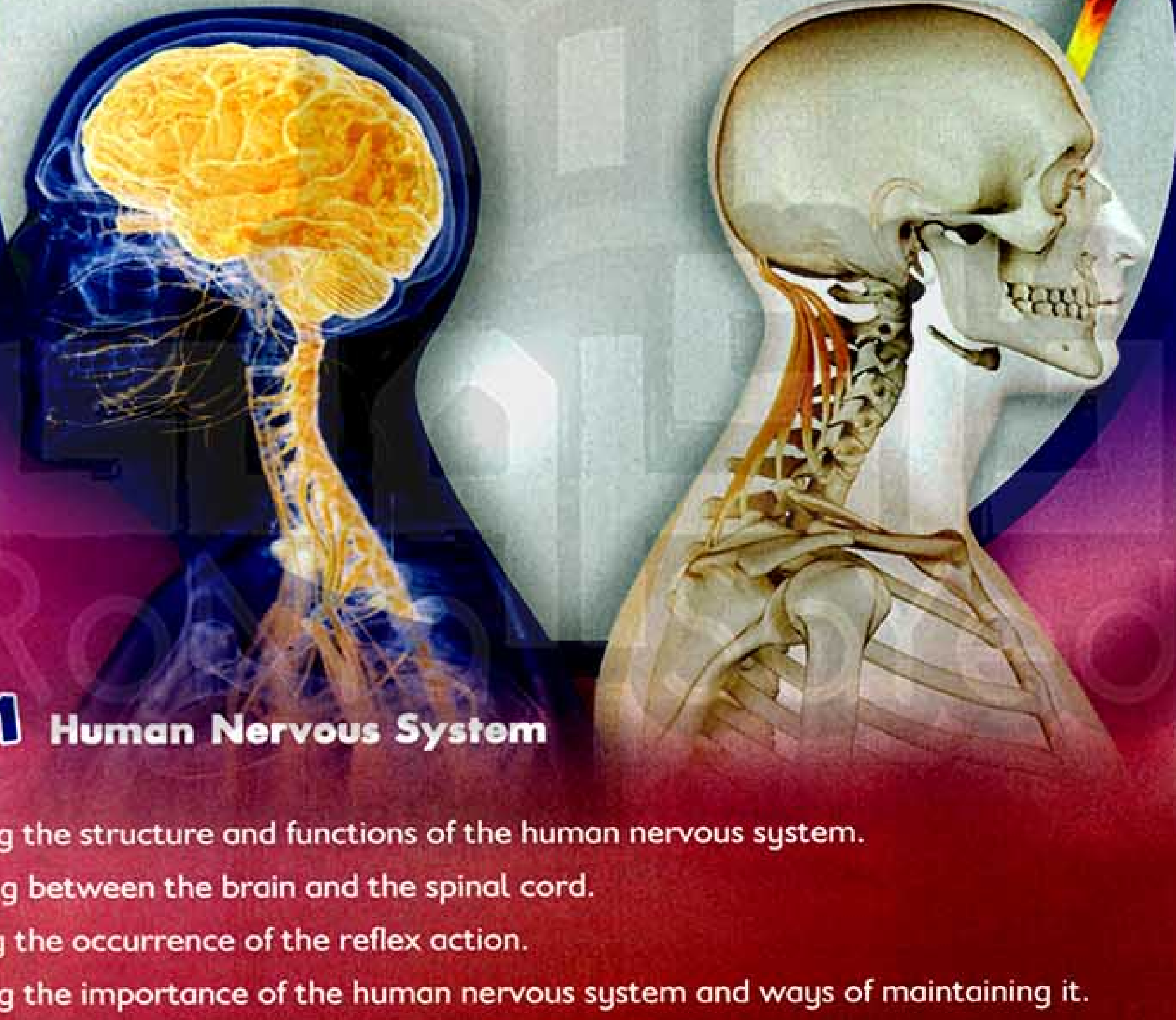
"Life issues"

- You have studied the importance of oxygen in human life and all living organisms. Discuss this topic in an article on the school wall bulletin.

Visit Egyptian Knowledge Bank to research further topics related to this Unit.

Unit 4

STRUCTURE AND FUNCTION OF LIVING ORGANISMS



Lesson 1 Human Nervous System

Objectives:

- Identifying the structure and functions of the human nervous system.
- Comparing between the brain and the spinal cord.
- Explaining the occurrence of the reflex action.
- Identifying the importance of the human nervous system and ways of maintaining it.

Lesson 2 Human Locomotory System

Objectives:

- Identifying the structure and functions of the human locomotory system.
- Comparing between different types of joints.
- Explaining the importance and joints for movement.

LESSON 1 Human Nervous System



Brain Gym

As you learned before, the nervous system is responsible for sensation and all activities of the body.

Tick the system that performs the following processes:



1. Feeling pain when you touch a hot object.
   a. Digestive system ◯ b. Nervous system ◯
2. Tasting a lemon.
   a. Respiratory system ◯ b. Nervous system ◯

We will learn more about the Nervous System.

The nervous system

- It is the system in our body which is responsible for communication and control.

The nervous system performs many functions such as:

1. It receives information from the environment and from your body, then it interprets this information and makes the body respond to it. It makes you feel pain.



2. It allows you to know if things are (hot, cold), (sweet, bitter), (rough or smooth).



3. It adjusts your movements.



4. It protects you from harm.



5. It adjusts the responses that require emotions, so it makes you happy, sad, angry or calm.



6 It allows you to solve problems and learn music.



7 It oversees, coordinates and regulates the multiple functions performed by the human body such as moving, feeding, digestion, breathing, thinking and others.



The neuron:

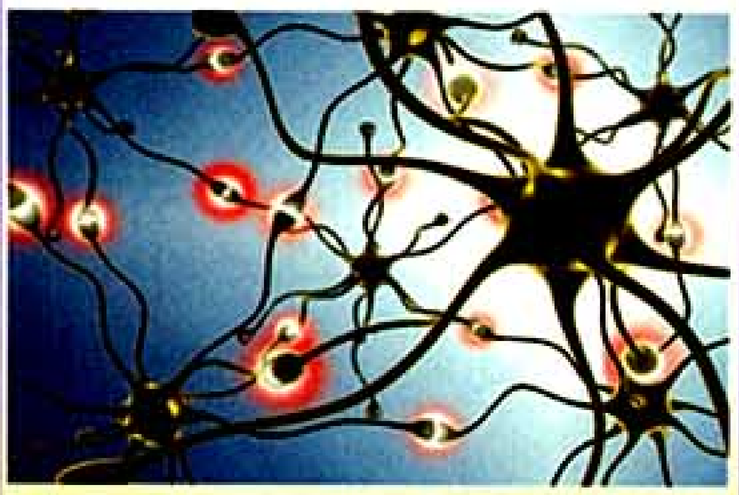
- The human nervous system is made of special cells called neurons.

Nerve cell (Neuron) : It is the building unit (basic structure) of the nervous system.

Activity

To know the components of the neuron:

Materials: A microscope - a slide of a neuron.

Steps	Illustration	Observation
Examine a slide of a neuron by microscope.		You can see the nerve cell.

Structure of the neuron

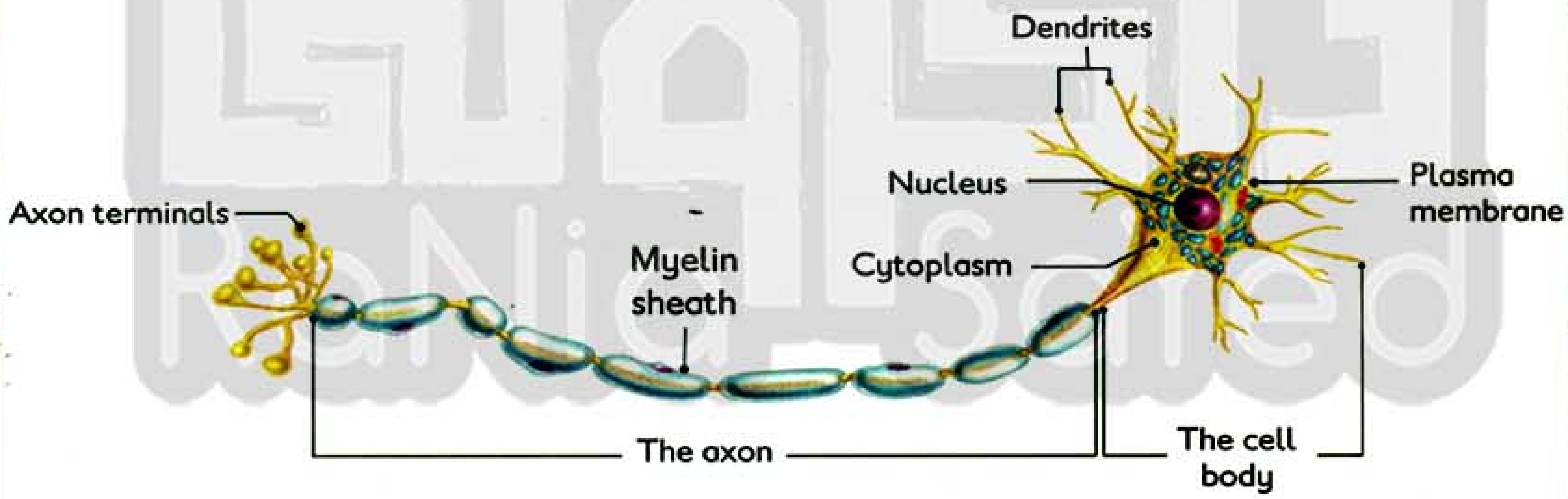
It consists of two parts which are:

The cell body

- It contains a nucleus, cytoplasm and a plasma membrane.
- There are some branches extending from it called dendrites.
- The function of dendrites:
  They are connected to the neighboring neurons forming synapses (synaptic area).

The axon

- It is a cylindrical axis covered with a fatty layer called myelin sheath.
- It ends with nerve endings called axon terminals.
- The function of axon terminals:
  They are connected to muscles or they form a synapse with the dendrites of other neurons.

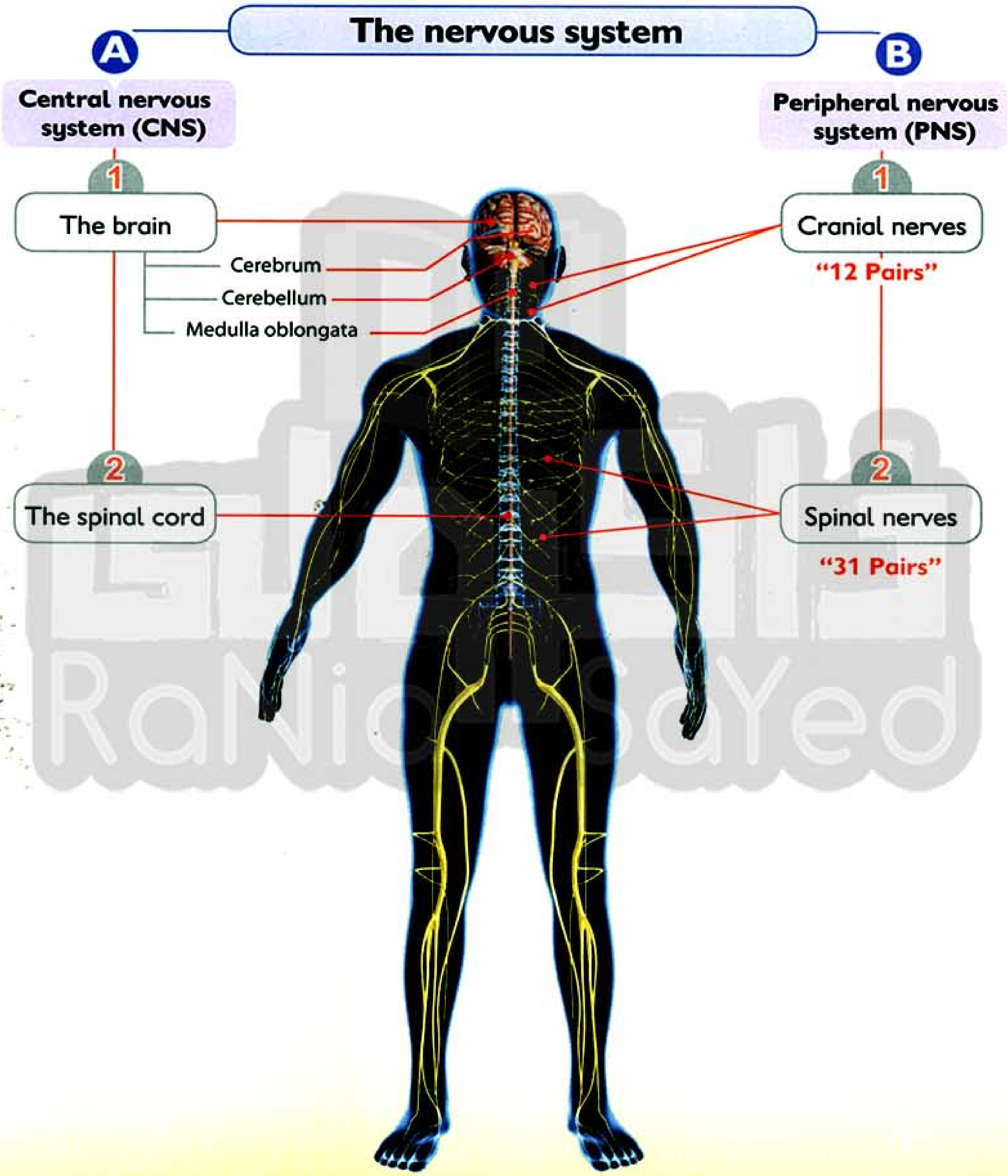


Check point Write the scientific term for each of the following: *(Answer Guide: P.18)*

1. The building unit of the nervous system. (..............................)
2. Branches extending from the neuron's body. (..............................)
3. A fatty layer that covers the axon of the neuron. (..............................)



Structure of the nervous system



1. The central nervous system:

It consists of:

1. The brain
2. The spinal cord

Do you know?
The adult human brain weighs about 1.5 kg.

1 The brain

- It is the main control center in the body like a computer.
- It is a nerve block containing millions of nerve cells (neurons).

Location:

It is located inside a bony box called the skull. **G.R.** To protect it.

Structure	Illustration	Function
The brain consists of three main parts which are: A. The cerebrum B. The cerebellum C. The medulla oblongata		It is the main control center in the body. **G.R.** Because it directs and coordinates all the processes, ideas, behaviors and emotions.

G.R. The brain is the maestro of all body systems.
Because it controls all functions of all systems.

Do you know?
The size of the brain does not affect intelligence, all adults have equal brain sizes.

Lesson 1

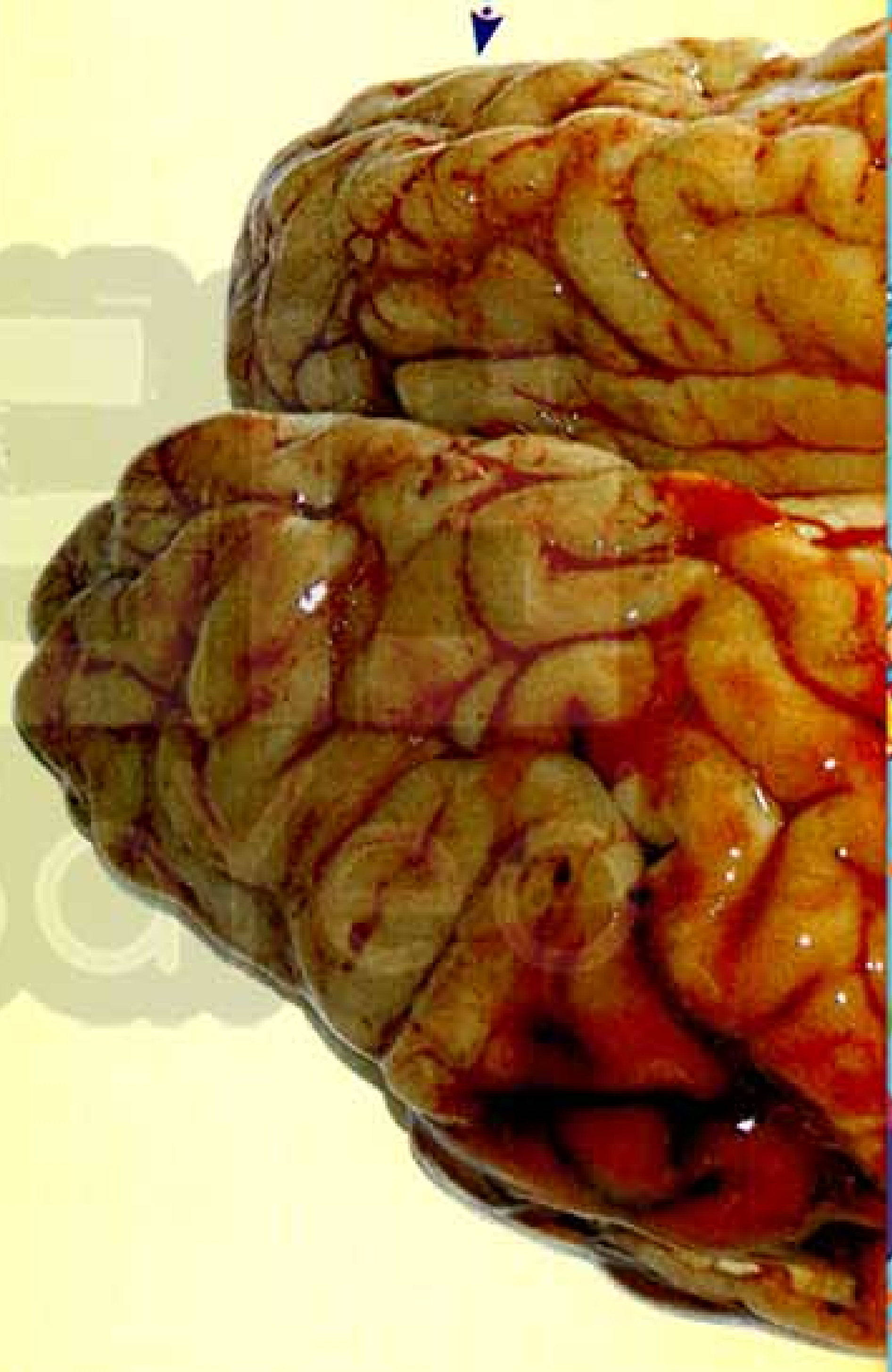
▷ **The brain consists of:**

(A) The cerebrum. (B) The cerebellum. (C) The medulla oblongata.

A The cerebrum

Description:

- It is the largest part of the brain.
- It is divided into two halves called the cerebral hemispheres separated by a fissure and attached together by nerve fibers.
- Its outer surface is called cerebral cortex or the gray matter and its color is gray, while the inner one is called the white matter.
- It has many convolutions and folds on its surface.



Location:

- The upper part of the brain inside the skull.

Function:

- It controls the voluntary movements of the body such as running in a race.
- It receives nerve impulses from sense organs (eyes, ears, nose, tongue and skin) and sends the appropriate responses to these impulses.
- It contains the centers of thinking and memory (concentration).

B The cerebellum

Location:

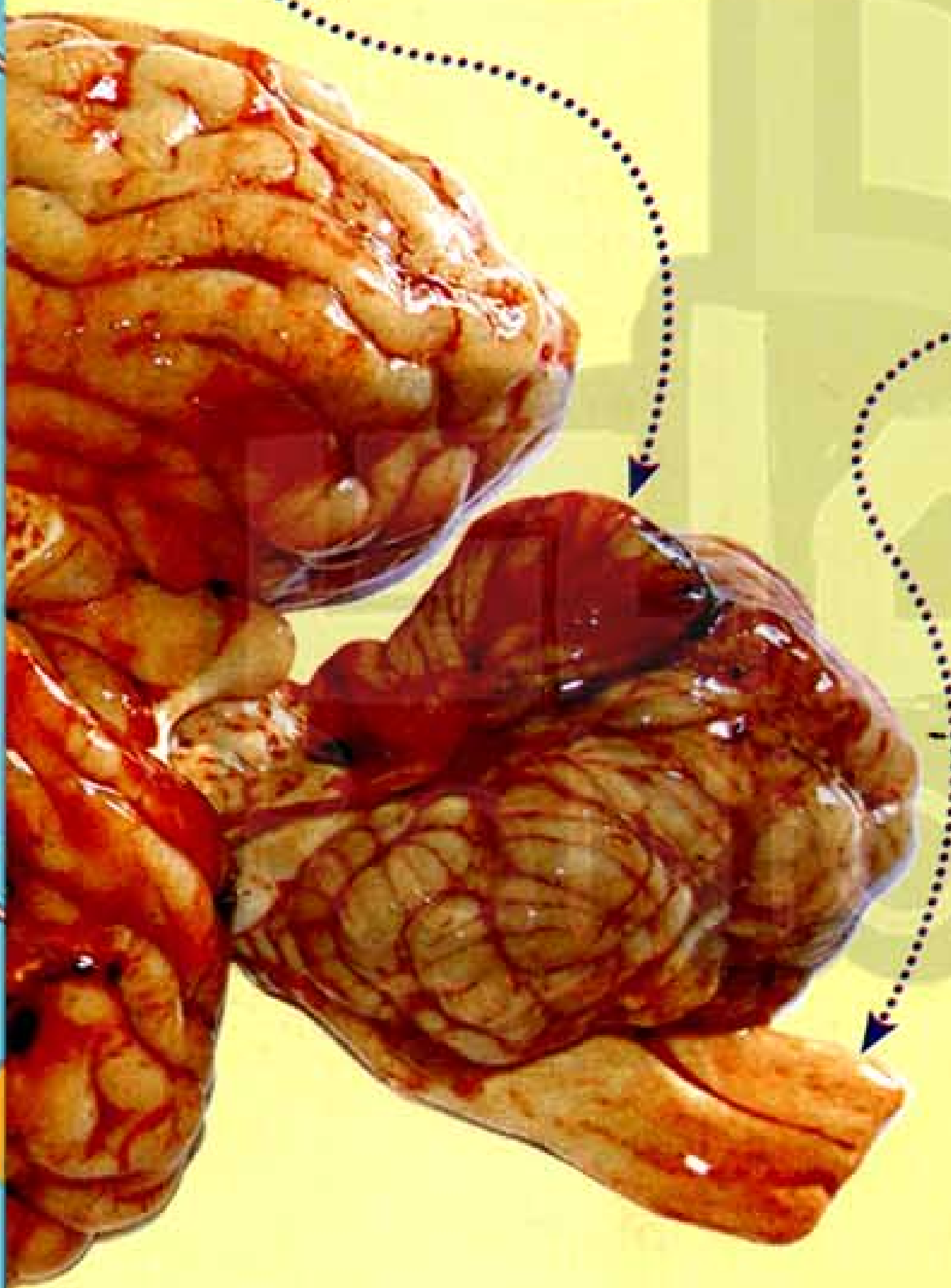
- It lies at the back area of the brain below (two hemispheres) the cerebrum.

Function:

- Keeping the balance of the body during movement.

G.R. The cerebellum has great importance during the movement of the body.

Because it is responsible for the balance of the body.



C The medulla oblongata

Location:

- It lies in front of the cerebellum.
- It connects the brain with the spinal cord.

Function:

- It is responsible for regulating the involuntary processes of the body such as:
  - Regulating heartbeats.
  - Regulating the movement of the respiratory system parts during breathing.
  - Regulating the movement and the function of the digestive system.

G.R. Damage to the medulla oblongata causes death.

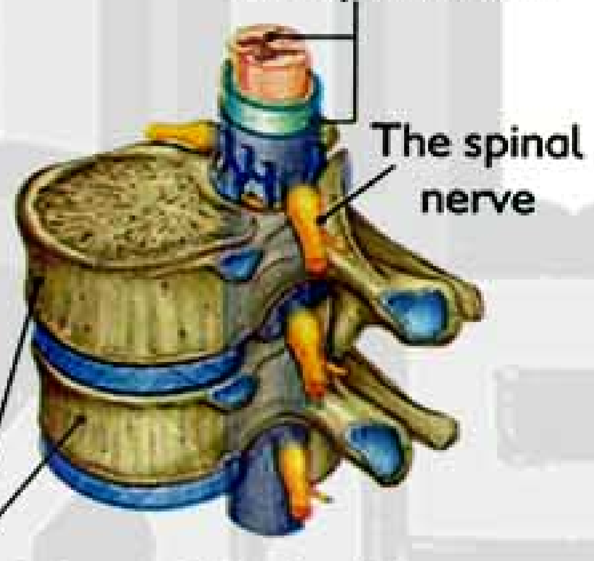
Because it is responsible for regulating the involuntary processes, any damage will affect heartbeats, breathing, etc. and that will lead to death.

2 The spinal cord

▸ It is a cylindrical cord from which the spinal nerves extend.

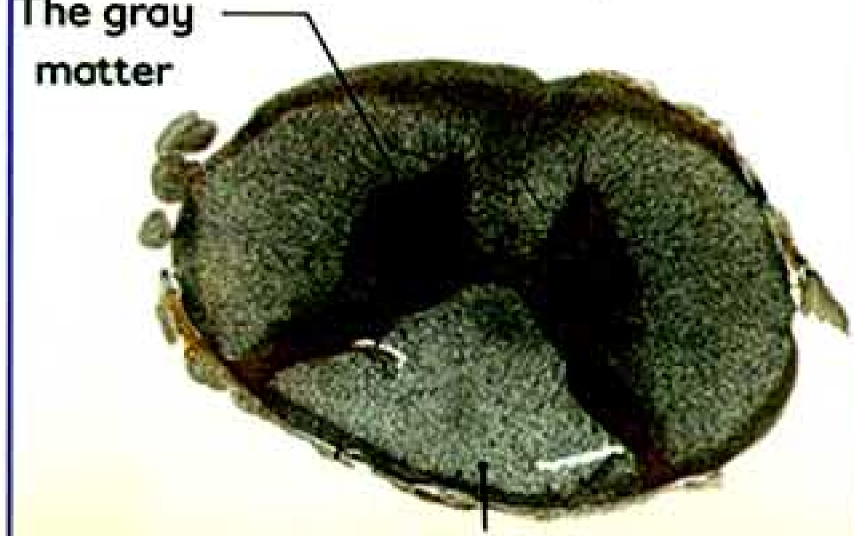
Location:

It extends within a canal inside a series of vertebrae (the backbone). **G.R.**
To protect it.

Structure	Illustration	Function
It consists of an internal gray matter (takes the shape of letter H) surrounded by the white matter.		• It delivers nerve messages from body organs to the brain and vice versa. • It is responsible for the reflex actions.

Activity To examine a cross-section of the spinal cord:

Materials: A microscope – a ready-made slide of the spinal cord.

Steps	Illustration	Observation
Examine a slide of a cross-section of the spinal cord by microscope.		The spinal cord appears consisting of an internal gray matter that appears in the shape of letter H and surrounded by the white matter.



Benchmark

Selected from Previous Exams

(Answer Guide: P. 18)

1. Write the scientific term for each of the following:

1. The basic structural unit of the nervous system. *(Cairo 2019)* (..)
2. The system that consists of the brain and the spinal cord. *(Sohag 2018)* (..)
3. The part of the brain that is responsible for regulating the involuntary processes such as heartbeats. *(Dakahlia 2017)* (..)

2. Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. The cerebellum is responsible for keeping the body balance during movement. *(Matrouh 2013)* (   )
2. The axon of the nerve cell is surrounded by a gelatinous layer. *(Aswan 2011)* (   )

3. Give reason for each of the following:

1. The brain is located inside a bony box called the skull. *(Cairo 2019)*

   ....

2. Damage of the medulla oblongata causes death. *(Sohag 2018)*

   ....

4. Complete the following sentences:

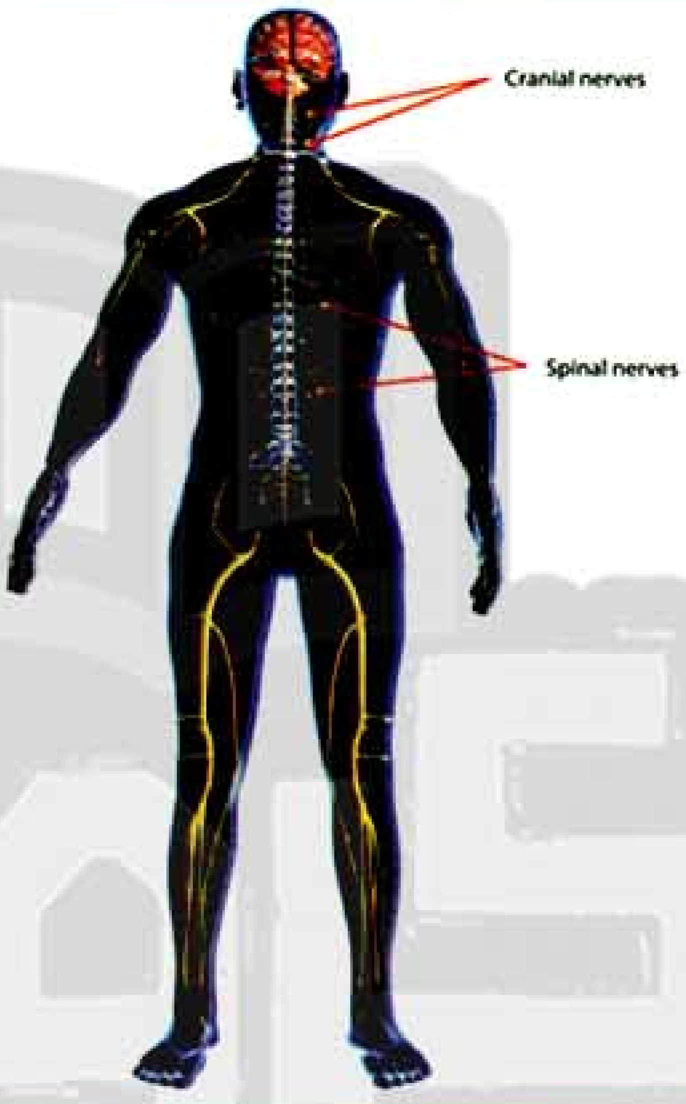
1. The brain consists of ...., ... and .... *(Suez 2017)*
2. The axon of nerve cell is surrounded by .... sheath. *(Qena 2016)*
3. The center of thinking and memory lies in .... *(Giza 2017)*

TRY TO SOLVE
Worksheet 13
Page 51

Lesson 1

2. The peripheral nervous system:

- It includes the nerves which emerge from the central nervous system (the brain and the spinal cord).

Structure	Illustration	Function
• The number of nerves in the human body is 43 pairs of nerves (86 nerves). **Divided into:** • Cranial nerves: 12 pairs of nerves emerge from the brain. • Spinal nerves: 31 pairs of nerves emerge from the spinal cord.		It delivers sensory information and kinetic responses between the central nervous system and all the body parts.

Comparison between the central nervous system and the peripheral nervous system:

Points of comparison	Central nervous system	Peripheral nervous system
Structure	• The brain. • The spinal cord.	Cranial nerves (12 pairs). Spinal nerves (31 pairs).
Function	• It directs and coordinates all the processes within the body. • It delivers nerve messages from body organs to the brain and vice versa. • It is responsible for reflexes.	• It delivers the sensory information and the kinetic responses between the central nervous system and all parts of the body.

The reflex action (Reflexes)

▶ When the body is subjected to external stimuli such as light heat and smell, it makes an involuntary response by the nervous system. It is called the reflex action.

Reflex action: It is the automatic (spontaneous) response of the body to different stimuli.

The organ responsible for reflexes is the spinal cord.

Examples of the reflex action:

1. Withdrawing the hand quickly on touching a plant with sharp thorns or a hot surface.



2. Blinking when something gets close to the eye.



3.
   - Reduction of the eye pupil size in response to intense light.
   - Increasing the eye pupil size in response to dim light.



4. Knee jerking when it is tapped by a solid object.



5. Secreting saliva on seeing or smelling good food.



Lesson 1

The stages of the reflex action

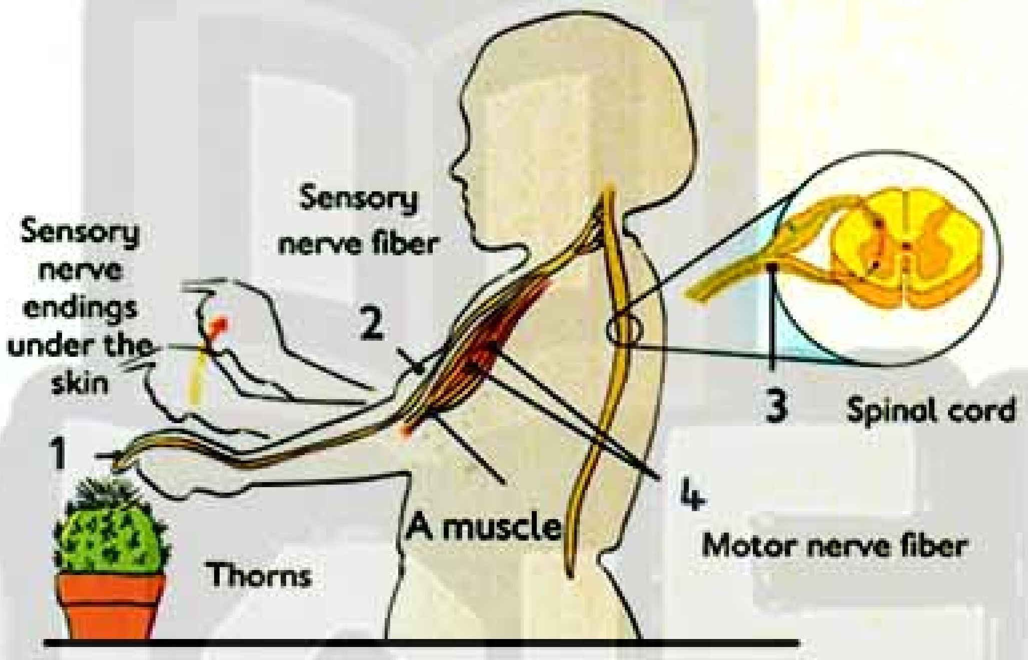
1 Stimulus

The thorns affect the nerve endings in the fingers producing nerve impulses.

3 Response

The nerve impulses are transmitted from the spinal cord through a motor nerve fiber to the arm muscles.

2 The nerve impulses are transmitted to the spinal cord through the sensory nerve fiber.



4 The muscles contract and the arm is pulled away from the thorns.

5 Other nerve impulses are transmitted from the spinal cord to the sensory centers in the brain leading to the true sense of pain.

The importance of the human nervous system:

Now we summarize the functions of the nervous system in the following points:

1. It carries nerve messages from an area of the body to another area.
2. It regulates and coordinates all the vital processes within the body.
3. It receives the external stimuli that surround the human body through the sensory organs, then identifies and interprets them.

Ways of maintaining the human nervous system:

1 Reducing the intake of the stimulating substances such as coffee and tea.
G.R. Because they affect sleeping periods and heartbeats and lead to nervous tension as well.



2 Staying away from tranquilizers and stimulants.
G.R. To keep the nervous system healthy.



3 Avoid sitting for a long period in front of computers and television.
G.R. To not exhaust the sensory organs.



4 Avoiding the extreme exciting situations.
G.R. To keep the nervous system healthy.



5 Staying away from sources of pollution (like noisy places and smoke emitted from exhausts of cars, factories, etc.).
G.R. Because they passively affect the nervous system.



6 Giving the body a sufficient period of rest especially during sleep.



7 Doing physical exercises.



8 Staying away from addiction.
G.R. Because it passively affects the nervous system, as it causes: Retardation of memory and learning - Nervous tension - Sluggishness - Loss of time sensation - Sleeplessness.



TRY TO SOLVE
Worksheet 14
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Lesson Overview

Summary

The nervous system: It is the system which is responsible for coordinating and regulating the multiple functions performed by the human body such as moving, feeding, digestion, breathing, thinking and others.

The nervous system

- The central nervous system
  - The brain
    - The cerebrum
    - The cerebellum
    - The medulla oblongata
  - The spinal cord
- The peripheral nervous system
  - Cranial nerves
    - 12 pairs
  - Spinal nerves
    - 31 pairs

The reflex action:

It is the automatic response of the body to different stimuli.

Importance of the human nervous system

1. It carries nerve messages from one area of the body to another area.
2. It carries nerve messages from one area of the body to another area.
3. It receives the external stimuli that surround the human body through the sensory organs, then identifies and interprets them.

Now, I am able to:

- Label the main organs of the nervous system.
- Identify that the brain is the main control center of the human body.
- Mention the importance of each part of the brain.
- Mention the importance of the spinal cord.
- Compare between the central nervous system and the peripheral nervous system.
- List different reflex actions which are performed by the help of the spinal cord.

Language Focus

communication	اتصال
response	استجابة
coordinate	ينسق
branches	فروع
main control center	مركز التحكم الرئيسى
intelligence	ذكاء
voluntary	إرادى
involuntary	لا إرادى
reflex actions	أفعال منعكسة

References

Ministry of Education (MOE) Books

Egyptian knowledge Bank

Al-Adwaa Application
- Al-Adwaa e-book
- Al-Adwaa Videos
- Al-Adwaa Question Bank

School Book Exercises on Lesson 1

Answer Guide: P. 18

1 Choose the correct answer:

1. The number of cranial nerves is .... pairs of nerves. (Cairo 2019)
   a. 31 b. 21 c. 12
2. The gray matter in the spinal cord appears in the shape of letter .... (Sohag 2018)
   a. H b. F c. A
3. The cerebellum is responsible for .... (Cairo 2013)
   a. thinking process b. the body's balance c. the reflex action
4. One of the components of nerve cell is the presence of .... (Sohag 2018)
   a. blood vessels b. cover of myelin c. dendrites
5. The .... controls the reflex actions. (Dakahlia 2017)
   a. spinal cord b. cerebellum c. cerebrum

2 Write the scientific term for each of the following statements:

1. Automatic response of the body to different stimuli. (Cairo 2019) (....................................)
2. Part of the nervous system responsible for the reflex actions. (Giza 2019) (....................................)
3. The basic structure unit of the nervous system. (Dakahlia 2019) (....................................)
4. Linked to the brain through the spinal cord and is responsible for involuntary actions. (Qalubia 2019) (....................................)
5. It consists of a gray matter in the form of letter H surrounded by the white matter. (Aswan 2018) (....................................)

3 Locate the following parts in the human body:

1. Cerebellum. .... (Alex. 2011)
2. Spinal cord. .... (Sharkia 2013)
3. Hemispheres. ....
4. Medulla oblongata. .... (Sharkia 2013)

4 Mention the importance of ... :

1. Medulla oblongata. *(Port Said 2014)*
   ....
2. Spinal cord. *(Cairo 2017)*
   ....
3. Skull. *(Cairo 2019)*
   ....
4. Cerebellum. *(Cairo 2019)*
   ....
5. Two hemispheres. *(Giza 2019)*
   ....

5 What happens if ...?

1. Sitting for long times in front of the computer. *(Aswan 2012)*
   ....
2. Your finger gets pricked by plant thorns. *(Aswan 2016)*
   ....
3. Continuous exposure to contaminated air from factories' smoke.
   ....
4. Approaching something to the eye.
   ....

6 Give a reason for each of the following:

1. Damage of the medulla oblongata causes death. *(Giza 2019)*
   ....
2. The brain is located inside the skull and the spinal cord extends through the inside of the backbone.
   ....
3. It is important not to take sleeping pills without the doctor's prescription.
   ....
4. Withdrawal of the hand quickly when it suddenly touches a hot surface. *(Beheira 2014)*
   ....

Al-Adwaa Exercises on Lesson 1

Answer Guide: P. 19

Function of the nervous system and structure of the neuron

1 Choose the correct answer:

1. The .... system interprets the external stimuli and makes the body respond to them.
   a. digestive b. respiratory c. nervous d. circulatory
2. The neuron is the building unit of the ....
   a. skeletal system b. nervous system c. muscular system d. locomotory system
3. Dendrites are branches extending from the ....
   a. neuron's cell body b. axon of neuron c. myelin sheath d. brain
4. The nerve cell consists of .... *(Assiut 2013)*
   a. nucleus b. cytoplasm
   c. plasma membrane d. (a), (b) and (c)
5. Myelin sheath surrounds the .... *(Cairo 2019)*
   a. nerve cell's axon b. cerebellum
   c. spinal cord d. cerebrum

2 Complete the following sentences:

1. .... is a communicating and controlling body system.
2. .... controls and regulates all the vital processes of the body.
3. .... is the building unit of the nervous system.
4. The neuron consists of .... and .... *(Gharbia 2019)*
5. .... is a cylindrical axis extending from the cell body of the neuron.
6. The axon of the nerve cell ends with a nerve ending called ....
7. The neighboring neurons are connected to each other through an area called ....
8. The cell body of the neuron contains ...., ... and plasma membrane.
9. The axon of the nerve cell is surrounded by .... sheath. *(Suez 2016)*
10. At the axon ending, there are .... that are connected to the muscles or form .... with other neurons.

3 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. The human digestive system is a communicating and controlling body system. (   )
2. The neuron is the building unit of the nervous system. *(Cairo 2019)* (   )
3. Dendrites are branches extending from the axon of neurons. (   )
4. The axon of the neuron is covered with a fatty layer called myelin sheath. (   )
5. The nerve cell consists of the cell body and the axon. (   )
6. The synapse is formed from the connection of the axons of the nerve cell. (   )

4 Write the scientific term for each of the following:

1. It is a communicating and controlling body system. *(Qalubia 2017)* (..............................)
2. The system which receives information from the environment and makes the body respond to it. (..............................)
3. The part of the neuron from which branches called dendrites are extended. (..............................)
4. The part of the neuron which is covered with a fatty layer. (..............................)
5. The nerve endings which are located at the end of the axon of neurons. (..............................)
6. A fatty layer that covers the axon of neurons. (..............................)
7. An area connecting between dendrites of the neighboring neurons. *(Aswan 2018)* (..............................)

5 Correct the underlined words:

1. The <u>skeletal system</u> is responsible for controlling and regulating all the vital processes of the human body. (..............................)
2. The neuron is the building unit of the <u>locomotory</u> system. (..............................)
3. The nerve cell consists of the cell body and <u>blood vessels</u>. *(Giza 2014)* (..............................)
4. The branches that extend from the neuron's body are called <u>axon terminals</u>. (..............................)
5. The axon of the neuron is covered with <u>a gelatinous layer</u>. *(Giza 2017)* (..............................)

6 Give a reason for each of the following:

1. The nervous system has great importance for the human body.

   ....

2. There are branches called dendrites extending from the neuron's body.

   ....

7 What happens if ...?

– The neurons lose their dendrites.

....

8 Define:

1. The nervous system.

   ....

2. The nerve cell (neuron).

   ....

3. Dendrites.

   ....

4. The synapse.

   ....

5. The myelin sheath.

   ....

9 What is the importance or the function of each of the following?

1. The nervous system. *(Beheira 2011)*

   ....

2. The neuron.

   ....

3. Axon terminals.

   ....

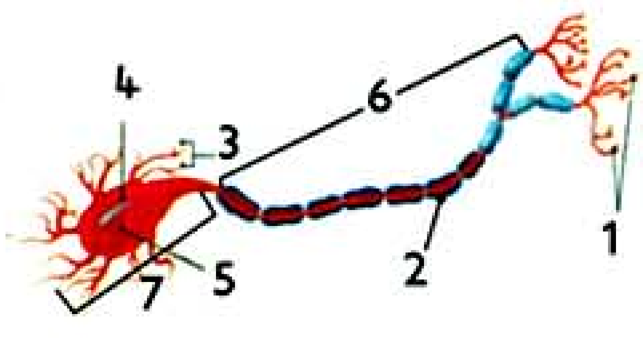
4. Dendrites.

   ....

10 Look at the following figure, then answer: *(Sohag 2019)*

1. This figure represents ....
2. Label the figure:

   1. .... 2. ....
   3. .... 4. ....
   5. .... 6. ....
   7. ....



Structure of the central nervous system

1 Choose the correct answer:

1. The central nervous system consists of .... *(Suez 2014)*
   a. the brain and cranial nerves
   b. the brain and the spinal cord
   c. the spinal cord and spinal nerves
   d. the spinal nerves and cranial nerves

2. The brain is protected by the ....
   a. skull
   b. backbone
   c. vertebral column
   d. (a) and (b)

3. The outer surface of the two cerebral hemispheres is called the cerebral cortex and its color is .... *(Prot Said 2013)*
   a. red
   b. orange
   c. black
   d. gray

4. Centers of thinking and memory are located in the .... *(Dakahlia 2019)*
   a. medulla oblongata
   b. cerebrum
   c. cerebellum
   d. spinal cord

5. The five sensation centers are located in the ....
   a. two cerebral hemispheres
   b. cerebellum
   c. medulla oblongata
   d. spinal cord

6. The .... connects the brain to the spinal cord.
   a. cerebrum
   b. cerebellum
   c. medulla oblongata
   d. axon terminals

7. The .... is the organ that controls heartbeats.
   a. cerebellum
   b. medulla oblongata
   c. cerebrum
   d. spinal cord

8. The vertebral column is a series of vertebrae that protect the ....
   a. spinal cord
   b. cerebrum
   c. cerebellum
   d. (b) and (c)

9. The part which is responsible for transferring nerve messages from different body parts to the brain and vice versa is the ....
   a. cerebellum
   b. vertebral column
   c. medulla oblongata
   d. spinal cord

10. All the following are parts of the brain except the .... *(Gharbia 2014)*
    a. cerebrum
    b. cerebellum
    c. medulla oblongata
    d. spinal cord

11. Keeping the body balance during movement is the function of the .... *(Cairo 2019)*
    a. cerebellum
    b. cerebrum
    c. medulla oblongata
    d. spinal cord

12. The .... controls the voluntary movements such as running in a race. *(Fayoum 2014)*
    a. cerebrum
    b. cerebellum
    c. medulla oblongata
    d. spinal cord

2 Complete the following sentences:

1. The nervous system consists of two major systems which are the .... nervous system and the .... nervous system. *(Sohag 2017)*
2. The central nervous system consists of .... and .... *(Cairo 2019)*
3. The brain is a nerve block consisting of millions of ....
4. The main control center in your body is .... and it is found inside a bony box called .... *(Port Said 2014)*
5. The brain consists of two cerebral hemispheres, ... and .... *(Sharkia 2018)*
6. The outer surface of the brain is called the .... matter, while the inner part is called the .... matter.
7. The center of thinking and memory lies in .... *(Giza 2017)*
8. The two cerebral hemispheres have many .... and .... on their surface.
9. The cerebrum controls the .... movements such as ....
10. .... lies at the back area of the brain below the two cerebral hemispheres.
11. .... maintains the balance of the human body during movement. *(Dakahlia 2014)*
12. .... is responsible for regulating the involuntary processes such as heartbeats.
13. .... lies in front of the cerebellum and connects the brain to ....
14. The spinal cord extends inside a canal within the ....
15. The gray matter of the spinal cord has the shape of the letter .... which is surrounded by the .... matter. *(Luxor 2012)*
16. The brain is protected by ...., while the spinal cord is protected by ....
17. The voluntary processes are controlled by ...., while the involuntary processes are controlled by ....
18. Heartbeats and respiratory movements are controlled by ...., while running is controlled by ....
19. Damage of the medulla oblongata causes ....

3 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. The two cerebral hemispheres control the involuntary movements such as heartbeats. (   )
2. The cerebellum is the largest part of the brain. (   )

3. The cerebellum is responsible for keeping the body balance during movement. *(Dakahlia 2019)* ( )
4. The cerebellum is the main control center in your body. *(Aswan 2011)* ( )
5. The centers of thinking and memory are located in the cerebrum. *(Cairo 2019)* ( )
6. The location of the medulla oblongata is below the cerebellum and it joins the brain to the spinal cord. ( )
7. The medulla oblongata is responsible for controlling the voluntary processes. *(Cairo 2019)* ( )
8. The spinal cord is protected by the backbone, while the brain is protected by the skull. ( )
9. The cerebellum controls the reflex actions. ( )
10. In the spinal cord, the white matter is internal, while the gray matter is external. ( )
11. The spinal cord controls heartbeats. *(Giza 2013)* ( )
12. The gray matter in the spinal cord takes the shape of letter H. *(Cairo 2013)* ( )

4 Write the scientific term for each of the following:

1. The system that consists of the brain and the spinal cord. *(Sohag 2011)* (..........)
2. The main control center in the human body. *(Cairo 2019)* (..........)
3. The nerve block that is located inside the skull. (..........)
4. The part of the central nervous system that coordinates all the processes, ideas, behaviors and emotions. (..........)
5. The part of the central nervous system consisting of the cerebrum, cerebellum and medulla oblongata. (..........)
6. The largest part of the brain which controls the voluntary processes such as running in a race. (..........)
7. The part of the brain containing the centers of thinking and memory. (..........)
8. The part of the brain that is responsible for keeping the body balance during the movement. *(Dakahlia 2016)* (..........)
9. The part of the brain that is responsible for regulating the involuntary processes such as heartbeats. *(Dakahlia 2017)* (..........)
10. The organ that consists of an internal gray matter taking H letter shape and is surrounded with white matter. (..........)
11. The part of the brain that lies at the back area of the brain below the two hemispheres. *(Cairo 2011)* (..........)

12. A bony box protecting the brain. *(Sohag 2018)* (..............................)
13. A series of vertebrae that surrounds the spinal cord and protects it. (..............................)
14. The part of the central nervous system which delivers the nerve messages from the body organs to the brain and vice versa. (..............................)

5 Correct the underlined words:

1. The centers of thinking and concentration lie in <u>the spinal cord</u>. *(Cairo 2019)* (..............................)
2. The brain is located inside a bony box called the <u>backbone</u>. (..............................)
3. The <u>cerebellum</u> is the largest part of the brain. (..............................)
4. The <u>medulla oblongata</u> maintains the body balance. *(Gharbia 2017)* (..............................)
5. The involuntary processes are controlled by <u>the cerebellum</u>. (..............................)
6. The <u>spinal cord</u> controls heartbeats. *(Suez 2014)* (..............................)
7. The spinal cord consists of an internal substance that is called the <u>white</u> matter and it appears in the shape of letter H. *(Cairo 2014)* (..............................)
8. The backbone protects <u>the brain</u>. (..............................)

6 Give a reason for each of the following:

1. The brain is located inside a bony box called the skull. *(Cairo 2019)*
....
2. The brain is the main control center in the human body. *(Menofia 2011)*
....
3. The cerebrum is a very important part of the brain.
....
4. The cerebellum has great importance for the human body. *(Assiut 2013)*
....
5. The medulla oblongata helps in breathing. *(Aswan 2018)*
....
6. The damage of the medulla oblongata leads to death. *(Cairo 2019)*
....
7. The spinal cord is located inside the backbone.
....

7 What happens if ...?

1. The cerebellum is shocked or infected.

....

2. The medulla oblongata is damaged. *(Qalubia 2019)*

....

8 What is the importance or the function of each of the following?

1. The brain. *(Suez 2011)*

....

2. The vertebral column for the nervous system.

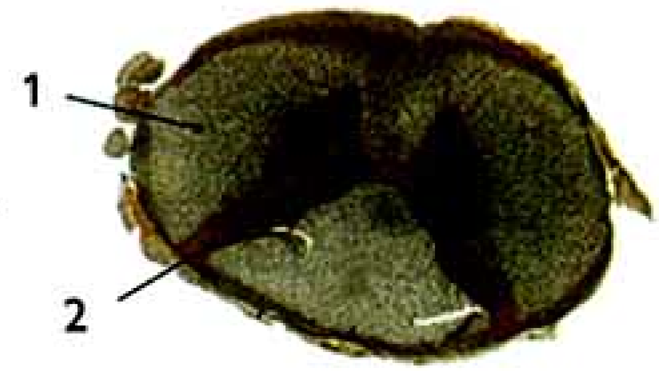
....

9 Compare between ...:

- The brain and the spinal cord:

Points of comparison	Brain	Spinal cord
Description		
Location		
Function		

10 Look at the following figure, then answer: *(Sohag 2019)*



1. This figure represents ....

2. Label the figure:

   1. .... 2. ....

3. What is the importance of this organ?

....

4. Mention its location in the body. *(Sohag 2018)*

....

Lesson 1

Structure of the peripheral nervous system - reflex action - how to keep the system healthy

1 Choose the correct answer:

1. The number of spinal nerves is .... pairs. *(Cairo 2019)*
   a. 31 b. 12 c. 21 d. 43
2. The peripheral nervous system consists of .... *(Suez 2016)*
   a. 43 pairs of nerves
   b. 31 pairs of nerves
   c. 12 pairs of nerves
   d. 44 pairs of nerves
3. The .... controls the reflex actions. *(Giza 2019)*
   a. spinal cord b. cerebellum c. cerebrum d. brain
4. .... are from the reflex actions. *(Qalubia 2017)*
   a. Heartbeats
   b. Eating when we are hungry
   c. Blinking of eyes when something comes close to them
   d. All the previous answers
5. Over intake of stimulating substances such as coffee causes ....
   a. increase of heartbeats
   b. decrease of sleeping periods
   c. nervous tension
   d. all the previous answers
6. All the following behaviors harm the nervous system except ....
   a. doing physical exercises
   b. addiction
   c. overuse of tranquilizers
   d. over intake of coffee

2 Complete the following sentences:

1. The peripheral nervous system consists of .... and .... *(Ismailia 2017)*
2. The nerves which emerge from the brain are called .... nerves and their number is .... pairs.
3. The nerves which emerge from the spinal cord are called .... and their number is .... pairs.
4. .... is responsible for the reflex actions, while the cerebellum is responsible for .... *(Menofia 2017)*

5. .... is a spontaneous response of the body to different stimuli.

6. .... controls the reflex actions (reflexes). *(Cairo 2019)*

7. Withdrawing your hand quickly when you touch a sharp thorn of a plant is due to ....

8. Over intake of stimulating substances such as tea and coffee affects .... and ....

9. We must stay away from .... and .... to keep the nervous system healthy.

3 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. The peripheral nervous system consists of 43 pairs of nerves. (   )
2. The number of nerves that extend from the spinal cord is 12 pairs. (   )
3. There are 12 pairs of spinal nerves and 31 pairs of cranial nerves. *(Damietta 2011)* (   )
4. The spinal cord is responsible for the reflex action in the human body. *(Ismailia 2013)* (   )
5. To keep the nervous system healthy, we must stay away from tranquilizers and stimulants. (   )

4 Write the scientific term for each of the following:

1. The system that consists of cranial nerves and spinal nerves. (......................)
2. 12 pairs of nerves that extend from the brain. (......................)
3. 31 pairs of nerves that extend from the spinal cord. (......................)

5 Correct the underlined words:

1. The nerves that extend from the brain are called the <u>spinal</u> nerves. (......................)
2. The <u>cranial nerves</u> extend from the spinal cord. (......................)
3. The number of cranial nerves is <u>31</u> pairs. *(Alex. 2014)* (......................)
4. The number of spinal nerves is <u>12</u> pairs. (......................)
5. The organ that is responsible for the reflex action is the <u>cerebrum</u>. *(Beheira 2018)* (......................)

6 Give a reason for each of the following:

1. Withdrawing your hand quickly when you touch a plant with sharp thorns. *(Gharbia 2019)*
....
2. Blinking of the eyelids when an object approaches the eye suddenly.
....
3. It is important to reduce the intake of stimulating substances such as tea and coffee.
....
4. You must stay away from tranquilizers and stimulants. *(Luxor 2013)*
....
5. You should avoid sitting for long periods in front of the computer. *(Cairo 2018)*
....
6. You must stay away from addiction.
....
7. You must sleep a sufficient period of time. *(Cairo 2012)*
....

7 What happens if ...?

1. You suddenly touch a hot surface. *(Beheira 2018)*
....
2. Over drinking of coffee and tea stimulants. *(Cairo 2019)*
....
3. If a human is exposed to noise constantly. *(Cairo 2017)*
....
4. The body is subjected to light for long periods. *(Gharbia 2014)*
....
5. Taking drugs.
....

8 Define:

1. Cranial nerves.
....
2. Spinal nerves.
....
3. The reflex action. *(Qalubia 2012)*
....

9 What is the importance or the function of each of the following?

1. The peripheral nervous system (nerves).
....
2. The reflex action.
....

10 Compare between ...:

1. Cranial nerves and spinal nerves:

Points of comparison	Cranial nerves	Spinal nerves
Description	....	....
Number	....	....

2. The central nervous system and the peripheral nervous system: *(Qalubia 2014)*

Points of comparison	Central nervous system	Peripheral nervous system
Structure	....	....
Function	....	....

11 Choose from column (B) what suits in column (A):

(A)	(B)
1. The brain	a. is located inside the backbone.
2. The spinal cord	b. extend from the brain.
3. Spinal nerves	c. extend from the spinal cord.
4. Cranial nerves	d. is located inside the skull.
5. The cerebellum	e. is a spontaneous response of the body to different stimuli.
6. The reflex action	f. maintains the balance of the body during movement.

1. .... 2. .... 3. .... 4. .... 5. .... 6. ....

12 **Locate each of the following parts in the human body:**

The part	Its location
1. Dendrites	....
2. Axon terminals	....
3. The brain	....
4. The cerebral cortex	....
5. The gray matter of the cerebrum	....
6. The white matter of the cerebrum	....
7. The gray matter of the spinal cord	....
8. The white matter of the spinal cord	....

13 **Mention five ways to maintain the human nervous system healthy.**

(Dakahlia 2017)

....

....

....

....

....

TIMSS Like Questions

on Lesson 1

Answer Guide: P. 22

1. Animals are able to respond to changes in their environment.

A coordinated response requires a stimulus, a receptor and an effector.

This is shown below in a flow chart.

stimulus ⟶ receptor ⟶ effector ⟶ response

The brain can act as the coordinator.

a. On the flow chart above, draw an **X** on one of the arrows to show where the brain would be involved.

b. The brain is a part of the central nervous system. Name the other structure which is also part of the central nervous system.

2. Blinking is a reflex action.

The following figure shows what is happening as an eye blinks and then opens again.



Suggest one reason why this reflex action is important to the body.

....

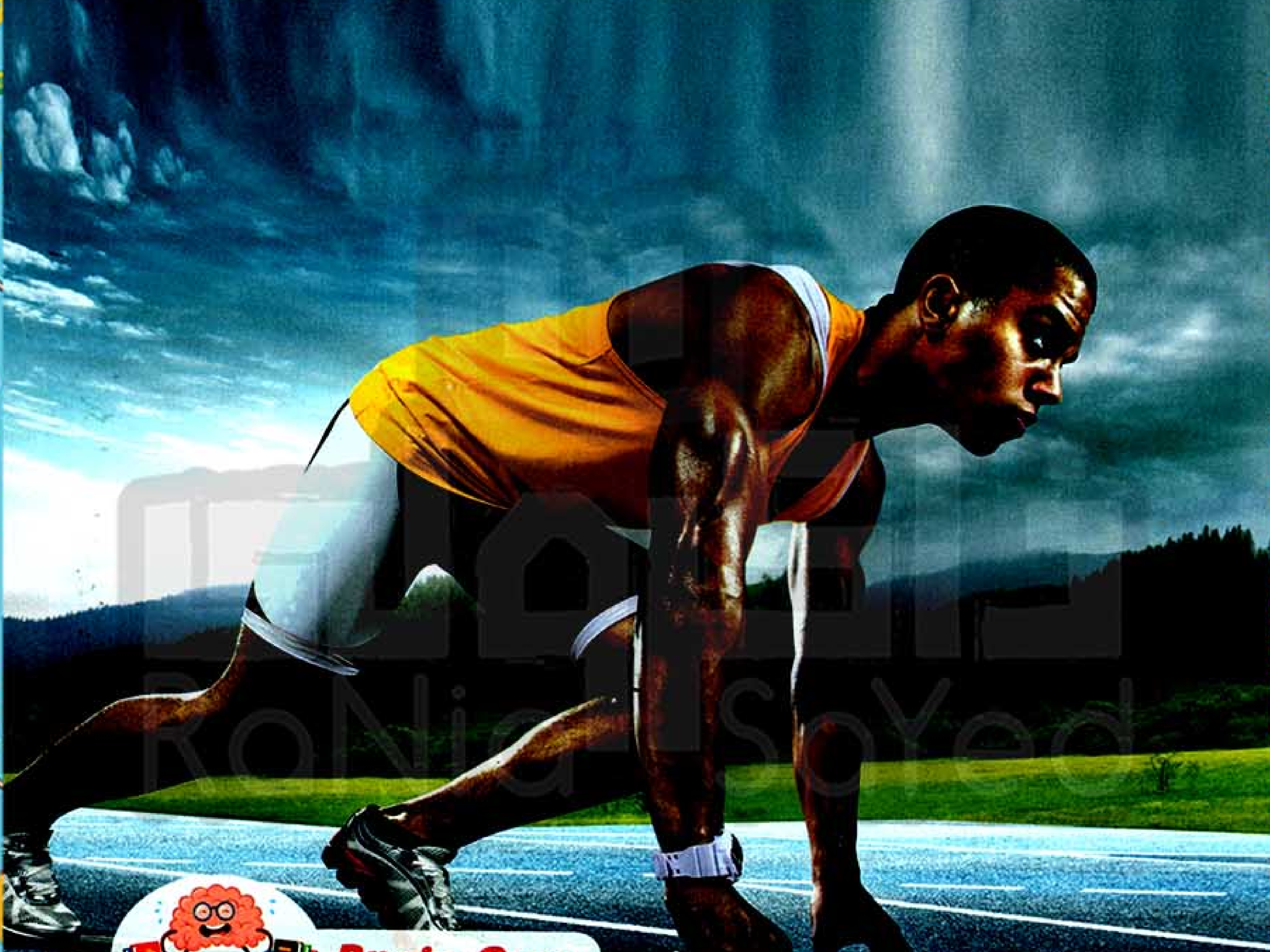
....

3. The table below shows three functions carried out by a part of the human body: Write the name of this part beside its function.

Function	The name of the responsible part of the body
Used for thinking	....
Responsible for reflexes	....
Keeping the balance of the body	....

4. Make a model of the nervous system using simple materials.

LESSON 2 Human Locomotory System



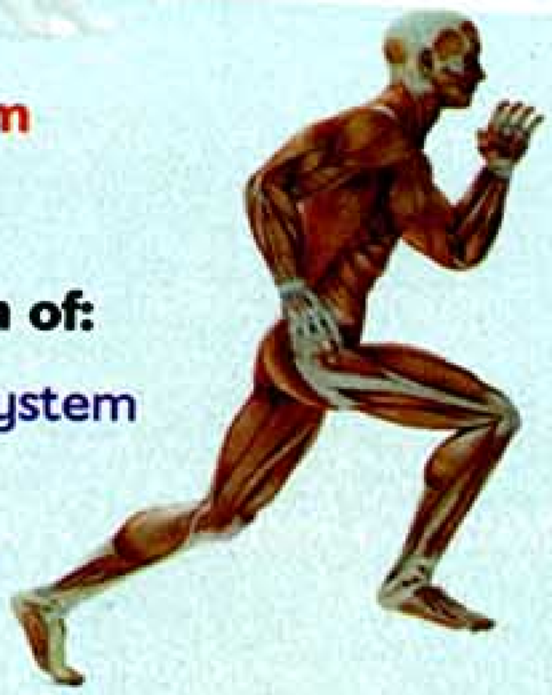
Brain Gym

All living organisms move to change their positions from place to another.

Movement occurs by the participation and integration of:

- Skeletal system
- Muscular system
- Nervous system

In this lesson, you will learn more about skeletal system, which is a part of the locomotory system.

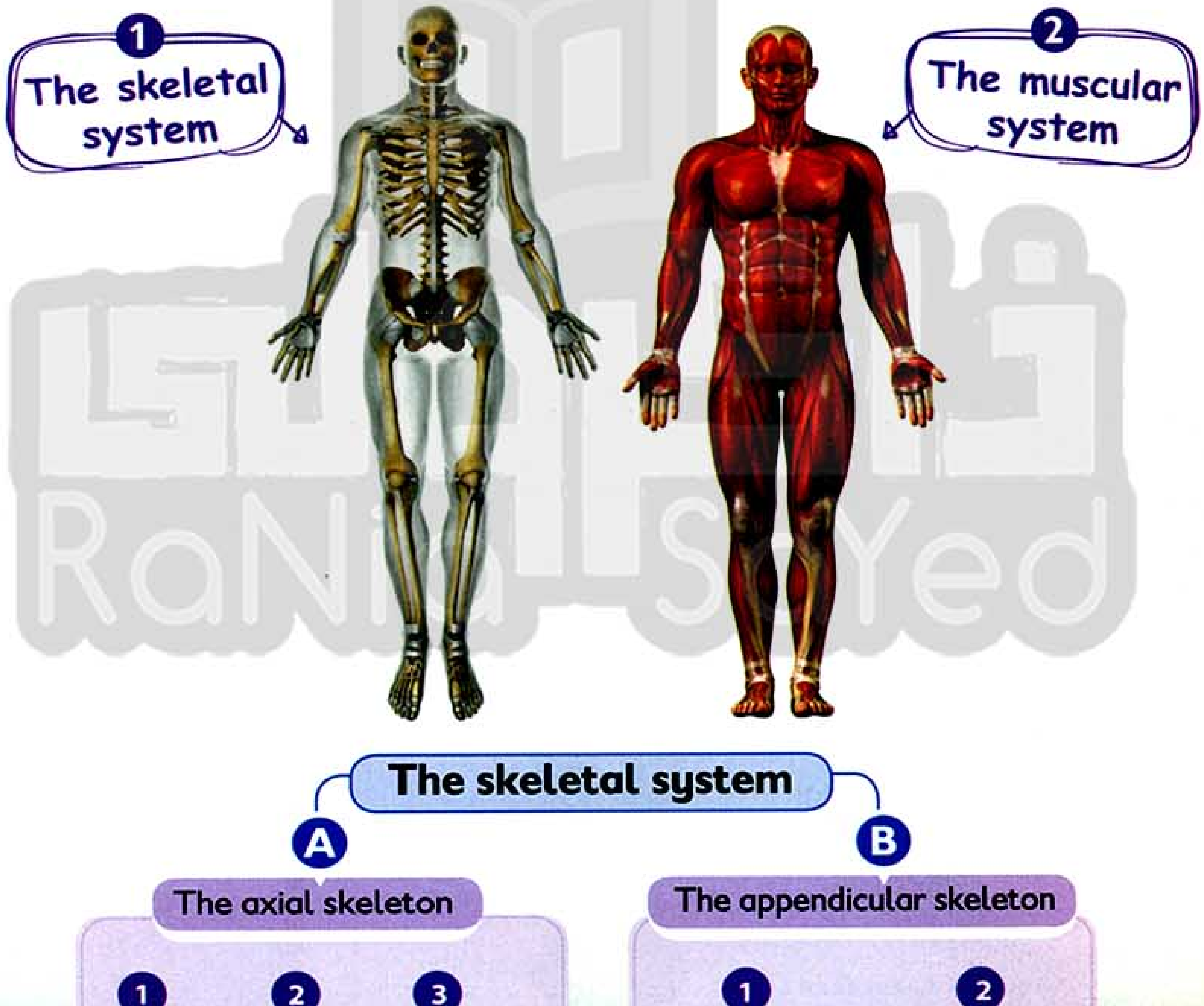


The locomotory system

It is the body system that is responsible for movement.

The structure of the human locomotory system:

- The locomotory body system consists of two major systems:



The skeletal system

A The axial skeleton

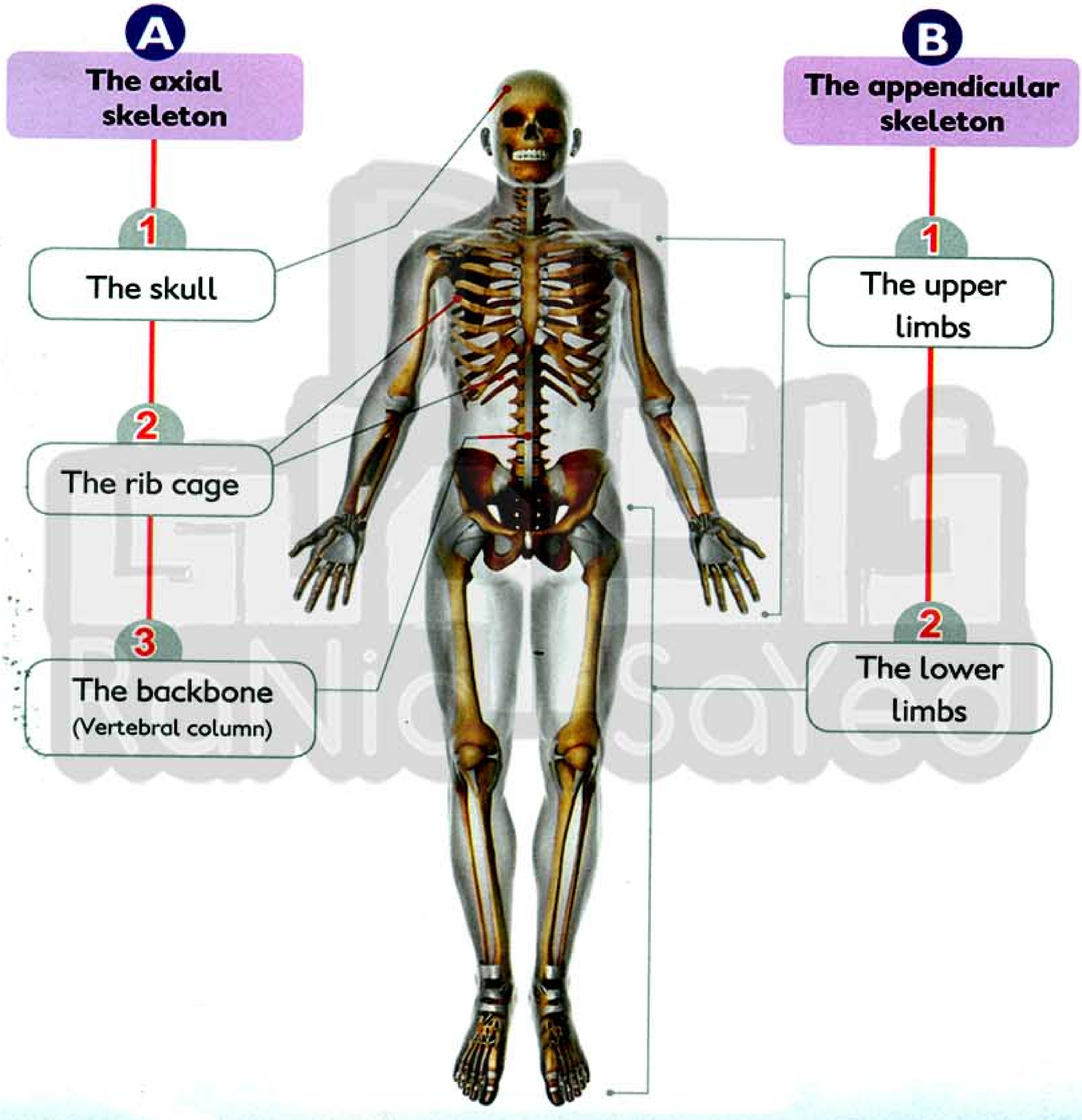
1. The skull
2. The backbone
3. The rib cage

B The appendicular skeleton

1. Bones of the upper limbs
2. Bones of the lower limbs

Lesson 2

1. The skeletal system



A The axial skeleton

The axial skeleton consists of:

1 The skull



Description:

- It is a bony box that contains cavities for eyes, ears and the nose.

Function:

- It protects the brain.

2 The backbone



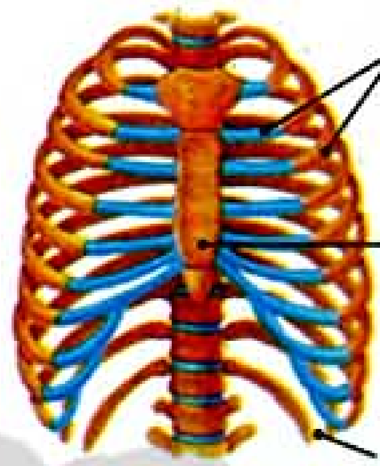
Description:

- It consists of 33 vertebrae.
- There are cartilages between vertebrae. G.R. To prevent their friction during movement.

Function:

- It allows the body to bend in different directions.
- It protects the spinal cord.

3 The rib cage



Description:

- It consists of 12 pairs of ribs.
- The first ten pairs are connected anteriorly to the sternum (breastbone).

Function:

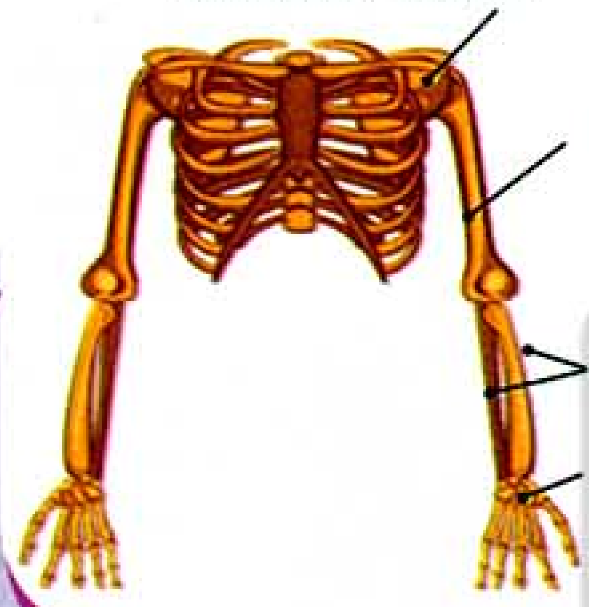
- It protects the lungs and the heart.
- It helps in the inhalation and exhalation processes.

Lesson 2

B The appendicular skeleton

The appendicular skeleton consists of:

1 Bones of the upper limbs



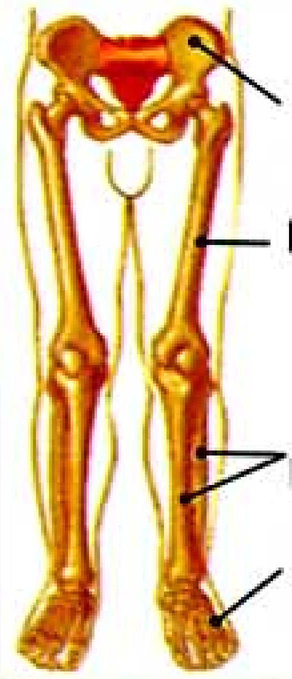
Description:

- They are connected to the shoulder bones.
- They consist of:
  - Humerus bone
  - Forearm bones
  - Hand bones

Function:

- They allow eating, drinking, writing and holding things.

2 Bones of the lower limbs



Description:

- They are connected to the pelvic (hip) bones.
- They consist of:
  - Femur
  - Shaft bones
  - Foot bones

Function:

- They allow walking, running, standing and sitting.
- They carry the rest of the body.

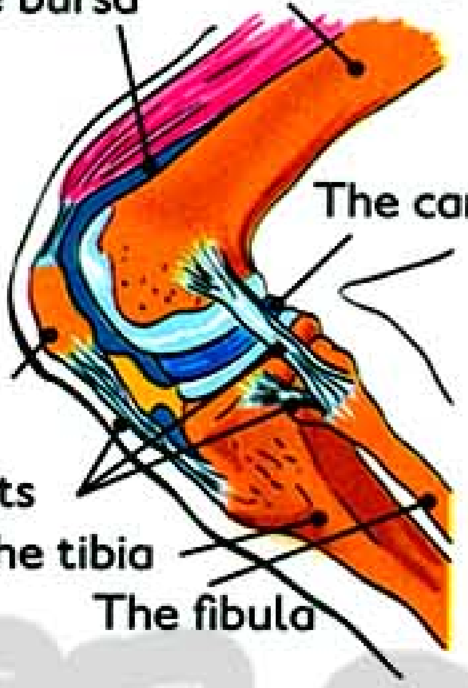
Check point Write the scientific term for each of the following: *(Answer Guide: P. 22)*

1. The body system which is responsible for the body movement. (..............................)
2. The bony box that contains cavities for eyes, ears and the nose. (..............................)
3. The structure that consists of 12 pairs of ribs. (..............................)



Joints and their significance to movement

The joint: It is the location at which bones meet each other.



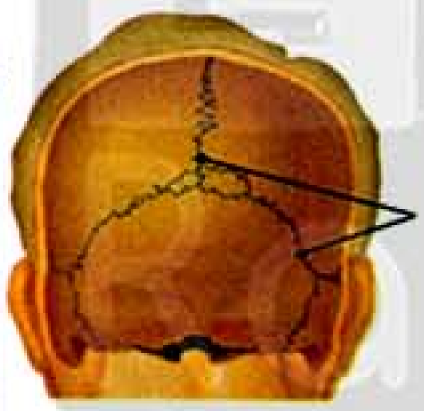
What is the importance of joints?

– They allow the movement between the bones.

▶ Types of joints:

- There are three types of joints:

A Immovable joints

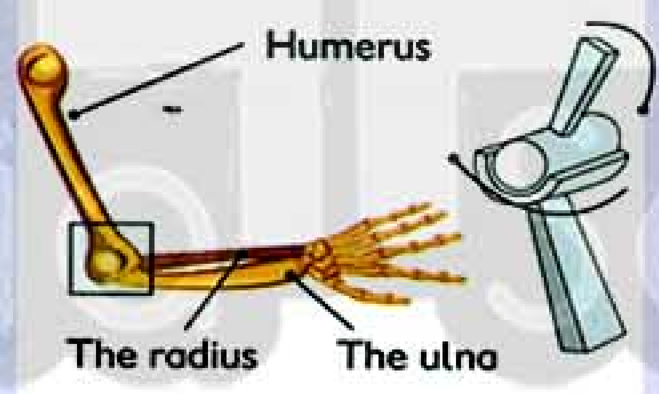


- They do not allow any movement.

Example:

- The joints between the bones of the skull.

B Slightly movable joints (limited)

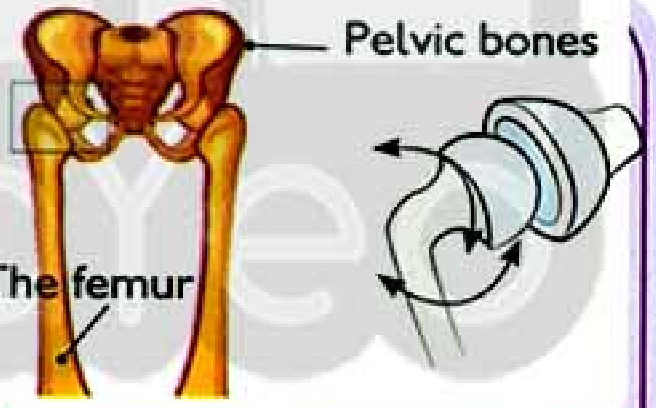


- They allow movement in one direction only.

Example:

- The knee and elbow joints.

C Freely movable joints (wide)



- They allow movement in all directions.

Example:

- The shoulder, wrist and thigh (hip) joints.

Lesson 2

Comparison between axial skeleton and appendicular skeleton:

Points of comparison	Axial skeletal system	Appendicular axial system
Structure	• The skull. • The backbone. • The rib cage.	• Bones of the upper limbs. • Bones of the lower limbs.
Function	**The skull** • It protects the brain. **The backbone** • It allows the body to bend in different directions. • It protects the spinal cord. **The rib cage** • It protects the lungs and the heart. • It helps in the inhalation and exhalation processes.	**Bones of the upper limbs** • They allow eating, drinking, writing and holding things. **Bones of the lower limbs** • They allow walking, running, standing and sitting.

Benchmark

Selected from Previous Exams

(Answer Guide: P. 22)

1. Write the scientific term for each of the following:

1. The bony box that protects the brain. *(Cairo 2019)* (..........................)
2. The structure that allows the body to bend in different directions. *(Giza 2016)* (..........................)
3. The part of the axial skeleton that protects the heart and lungs. *(Dakahlia 2016)* (..........................)
4. The type of skeleton which includes the bones of the upper and lower limbs. *(Gharbia 2017)* (..........................)

2. Complete the following sentences:

1. The human skeletal system consists of .... and .... *(Giza 2019)*
2. The backbone consists of .... vertebrae, while the rib cage consists of .... ribs. *(Cairo 2019)*
3. .... is from the immovable joints, while .... is from the movable ones. *(Alex. 2016)*

3. What happens if ...?

- All human bones are fixed with each other. *(Dakahlia 2017)*

....

4. Give reason for each of the following:

- The rib cage surrounds the heart and lungs. *(Qalubia 2017)*

....

5. Look at the following figure, then answer:



1. The type of the joints A, B and C is ....,
   while the type of joint D is ....
2. Joints A, B and C move in ....,
   while joint D moves in ....

TRY TO SOLVE
Worksheet 15
Page 55
Worksheet 16
Page 57

Lesson Overview

Summary

The locomotory system
- The skeletal system
  - The axial skeleton
    - The skull
    - The backbone
    - The rib cage
  - The appendicular skeleton
    - The bones of the upper limbs
    - The bones of the lower limbs
- The muscular system

The joint: It is the location at which bones meet each other.

Types of joints

- **Immovable joints**
  They do not allow any movement.
  Ex. The joints between the bones of the skull
- **Slightly movable joints**
  They allow movement in one direction only.
  Ex. The knee and elbow joints
- **Freely movable joints**
  They allow movement in all directions.
  Ex. The shoulder, wrist and thigh joints

Now, I am able to:

- Classify the skeletal system into two main parts.
- Label the main organs of the skeletal system.
- List the different types of joints inside the human body.

Language Focus

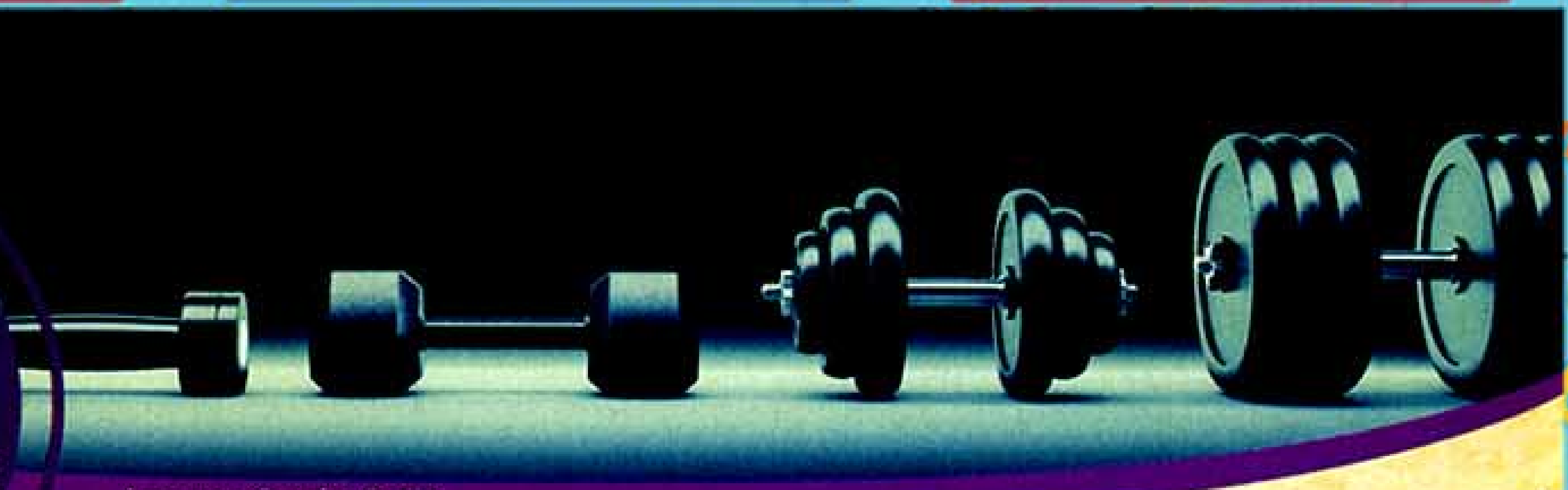
locomotory system	الجهاز الحركى
muscular system	الجهاز العضلى
skeletal system	الجهاز الهيكلى
bones	عظام
limbs	أطراف
cavities	تجاويف
immovable	غير متحرك
slightly movable	محدود الحركة

References

Ministry of Education (MOE) Books

Egyptian Knowledge Bank

Al-Adwaa Application
- Al-Adwaa e-book
- Al-Adwaa Videos
- Al-Adwaa Question Bank



School Book Exercises on Lesson 2

Answer Guide: P. 22

1 Write the scientific term for each of the following statements:

1. The structure which consists of the skull, backbone and rib cage. *(Cairo 2019)* (..............................)
2. The axis of the skeleton in the human body. (..............................)
3. The type of skeleton which includes the bones of the upper and lower limbs. *(Gharbia 2017)* (..............................)
4. Two bones meeting area. *(Sohag 2015)* (..............................)

2 Determine the type of the following joints:

1. Knee joint. *(Qena 2013)*

   ....

2. Elbow joint. *(Ismailia 2017)*

   ....

3. Shoulder joint. *(Qena 2013)*

   ....

3 What happens if ...?

- The thigh joint has limited movement.

  ....

4 Put (✓) in front of the the right statement and (X) in front of the wrong one, then correct it:

1. The skeleton of the lower limbs consists of humerus bone, 2 forearm bones and bones of the hand. *(Aswan 2018)* (   )
2. Knee joint is a freely movable joint. *(Cairo 2019)* (   )
3. Shoulder joint is an immovable joint. *(Qalubia 2017)* (   )
4. Joints link bones with muscles. (   )

Al-Adwaa Exercises on Lesson 2

Answer Guide: P. 22

Structure of the skeletal system (axial and appendicular)

1 Choose the correct answer:

1. The ability of the living organism to change its position from a place to another is known as ....
   a. movement b. inhalation c. exhalation d. feeding
2. The appendicular skeleton consists of the ....
   a. upper limbs b. lower limbs c. backbone d. (a) and (b)
3. The human backbone consists of .... vertebrae. *(Cairo 2018)*
   a. 12 b. 33 c. 43 d. 31
4. The .... is a bony box protecting the brain.
   a. skull b. backbone c. vertebral column d. humerus
5. The human rib cage consists of .... pairs of ribs. *(Cairo 2019)*
   a. 43 b. 33 c. 12 d. 31
6. In the human rib cage, the first .... pairs of ribs are connected to the sternum bone.
   a. 11 b. 10 c. 5 d. 12
7. All the following systems participate in the process of movement except the ....
   a. nervous system b. skeletal system
   c. muscular system d. digestive system
8. The axial skeleton consists of all the following parts except the ....
   a. skull b. backbone c. rib cage d. upper limbs
9. The .... protects the spinal cord.
   a. skull b. backbone c. femur d. humerus
10. The human rib cage protects the ....
    a. lungs b. heart c. spinal cord d. (a) and (b)
11. The femur bone belongs to the bones of the .... *(Beni Suef 2014)*
    a. upper limbs b. lower limbs c. backbone d. axial skeleton
12. The humerus bone is one of the bones of the ....
    a. lower limbs b. upper limbs c. axial skeleton d. skull

Lesson 2

2 Complete the following sentences:

1. The human locomotory system consists of two systems which are the .... system and the .... system. *(Giza 2018)*
2. .... is the ability of an organism to change its position from a place to another.
3. The human skeletal system consists of .... and .... *(Azhar 2016)*
4. The axial skeleton consists of ...., ... and .... *(Qalubia 2014)*
5. The skull is a bony box containing cavities for ...., ... and ....
6. .... is a bony box protecting the brain.
7. The human backbone consists of .... vertebrae, while the rib cage in man consists of .... pairs of ribs.
8. The number of vertebrae of vertebral column is .... *(Aswan 2013)*
9. The first ten pairs of the ribs are connected anteriorly to the ....
10. The appendicular skeleton consists of bones of .... and bones of ....
11. The upper limbs are connected to the .... and include .... and ....
12. Bones of the lower limbs are connected to .... and include .... and ....
13. The human movement occurs with the participation and integration of ...., ... and ....
14. There are .... between vertebrae to prevent their friction during movement.
15. .... allows the body to bend in different directions.
16. The rib cage protects the .... and .... *(Suez 2017)*
17. .... helps in the processes of inhalation and exhalation.
18. .... allow us to eat, drink, write and hold things.

3 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. The locomotory system is the system that is responsible for applying movement. (   )
2. The axial skeleton consists of the skull, the backbone and the rib cage. (   )
3. The backbone of the human being consists of 36 vertebrae. (   )
4. The rib cage consists of 12 pairs of vertebrae. *(Assiut 2012)* (   )
5. The skeleton of lower limbs consists of humerus, two forearm bones and bones of hand. *(Aswan 2016)* (   )

6. The rib cage helps in inhalation end exhalation processes. ( )
7. Bones of the lower limbs are connected to the shoulder bones. *(Ismailia 2017)* ( )
8. There are ribs between the backbone vertebrae. ( )
9. The skull protects the spinal cord. ( )
10. The function of cartilages is preventing the friction between bones during motion. ( )

4 Write the scientific term for each of the following:

1. The system that is responsible for applying the movement. (..........)
2. A system built up of the skeletal system and the muscular system. (..........)
3. The ability of the living organism to change its position. (..........)
4. The bony case that protects the brain. *(Fayoum 2014)* (..........)
5. Structures which are located between vertebrae of the backbone to prevent their friction during motion. *(Giza 2014)* (..........)
6. The structure that allows the body to bend in different directions. (..........)
7. It consists of 33 bony vertebrae. *(Assiut 2014)* (..........)
8. The part of the axial skeleton that protects the heart and lungs. *(Dakahlia 2016)* (..........)
9. The structure of the rib cage to which the first ten pairs of ribs are connected. *(Gharbia 2018)* (..........)
10. The part of the axial skeleton that helps in inhalation and exhalation processes. (..........)
11. The first bone of the upper limb that is connected to the shoulder bones. (..........)
12. The first bone of the lower limb that is connected to the pelvic bones. (..........)

5 Correct the underlined words:

1. The skeletal system consists of the axial skeleton and the central skeleton. (..........)
2. The axial skeleton includes the skull, the backbone and upper limbs. (..........)
3. The vertebral column consists of 35 vertebrae. *(Dakahlia 2016)* (..........)

4. The rib cage consists of 12 pairs of nerves. (..........)
5. The rib cage protects lungs and the brain. (..........)
6. The number of ribs jointed to the sternum is 11 pairs. (..........)
7. The rib cage helps in the processes of inhalation and digestion. (..........)
8. Movement of our body depends on the work of bones and cartilages together. (..........)
9. Bones of upper limbs are connected to pelvic bones. (..........)
10. Bones of lower limbs are connected to shoulder bones. (..........)

6 Give a reason for each of the following:

1. Man's movement depends on the integration of more than one system.
....
2. Presence of the brain inside the skull.
....
3. The backbone has great importance for the human body.
....
4. Presence of the spinal cord inside the backbone.
....
5. There are cartilages between the vertebrae of the backbone. *(Fayoum 2011)*
....
6. The rib cage surrounds the heart and lungs. *(Qalubia 2017)*
....
7. Upper limbs have great importance for the human body.
....
8. Lower limbs have great importance for the human body.
....

7 What happens if ...?

1. The backbone consists of one bone.
 ....
2. There are no of cartilages between vertebrae of the backbone. *(Alex. 2013)*
 ....

8 What is the importance or the function of each of the following?

1. The skull. *(Giza 2019)*
 ....
2. The rib cage. *(Giza 2019)*
 ....
3. The backbone. *(Assiut 2013)*
 ....
4. Cartilages between vertebrae of the backbone. *(Suez 2017)*
 ....
5. Bones of the upper limbs. *(Cairo 2018)*
 ....
6. Bones of the lower limbs.
 ....

9 Choose from column (B) what is suitable for in column (A):

(A)	(B)
1. The skull	a. protects the spinal cord.
2. The backbone	b. protects the brain.
3. The rib cage	c. protects the heart and lungs.
4. The forearm	d. belongs to the bones of the upper limbs.
5. The leg	e. belongs to the bones of the lower limbs.

1. .... 2. .... 3. .... 4. .... 5. ....

10 Compare between ...:

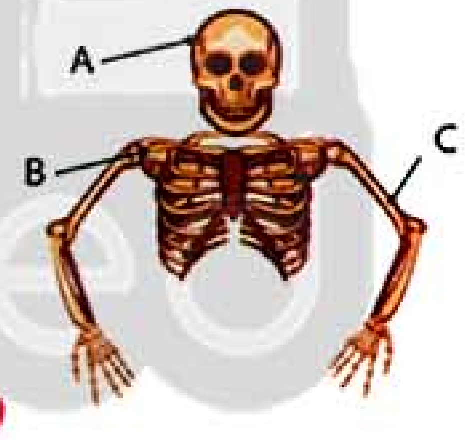
1. The axial skeleton and the appendicular skeleton:

Point of comparison	Axial skeleton	Appendicular skeleton
Structure	....	....

2. The upper limb and the lower limb in human: *(Beheira 2014)*

Point of comparison	Upper limb	Lower limb
Structure	....	....

11 Look at the following figure, then answer:



1. Write the name of the labeled parts (A), (B) and (C).

A : ....

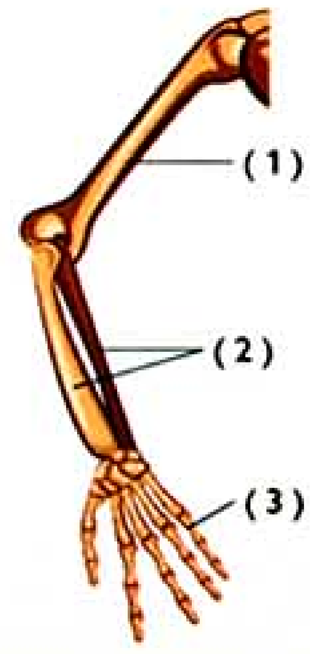
B : ....

C : ....

2. Write the function of the labeled part (A). *(Menofia 2014)*

....

12 Look at the following figure, then answer: *(Gharbia 2016)*



1. .... bones.
2. .... bones.
3. .... bones.

Joints and their significance to movement

1 Choose the correct answer:

1. The location at which the bones meet together is called .... *(Giza 2019)*
   a. tendon b. joint c. humerus d. skull
2. The skull joints are .... *(Giza 2019)*
   a. immovable b. slightly movable c. freely movable d. no correct answer
3. .... is from the immovable joints. *(Cairo 2019)*
   a. Shoulder joint b. Wrist joint c. Skull joint d. Elbow joint
4. The joint which allows the movement in one direction only is .... *(Giza 2018)*
   a. immovable b. freely movable
   c. slightly movable d. no correct answer
5. Among the freely movable joints are .... joints. *(Assiut 2014)*
   a. knee b. thigh c. elbow d. joints of the skull
6. Which of the following joints is a slightly movable joint? – .... *(Kafr El-Sheikh 2014)*
   a. The shoulder b. The wrist c. The ankle d. The elbow
7. Which of the following joints is limited movable? – .... *(Assiut 2016)*
   a. The shoulder b. The wrist c. The elbow d. The thigh

2 Complete the following sentences:

1. The .... is the site of meeting of two bones. *(Alex. 2019)*
2. There are three types of joints which are ...., ... and ....
3. The joints between bones of the skull are from the .... joints.
4. .... and .... joints are from the slightly movable joints.
5. Shoulder and thigh joints are examples of .... joints. *(Dakahlia 2017)*
6. The knee joint is considered from .... joints, while the hip joint is considered from .... joints. *(Dakahlia 2014)*

3 Put (✓) in front of the correct statement and (✗) in front of the incorrect one, then correct it:

1. Elbow joint is an immovable joint. (   )
2. The joints between bones of the skull are freely movable. (   )

4 Write the scientific term for each of the following:

1. The location at which bones touch and allow movement. *(Qalubia 2017)* (..................)
2. The type of joints that do not allow any movement. (..................)
3. The type of joints that allow movement in all directions. (..................)
4. The joint which allows movement in one direction only. *(Alex. 2014)* (..................)

5 Correct the underlined words:

1. Tendons are the sites of bones meeting. *(Cairo 2018)* (..................)
2. The knee joint is a freely movable joint. *(Sohag 2018)* (..................)
3. The shoulder joint is an immovable joint. *(Cairo 2018)* (..................)
4. The slightly movable joints allow movement in all directions. (..................)
5. Freely movable joints allow movement in one direction. *(Beni Suef 2014)* (..................)

6 Give a reason for each of the following:

1. The elbow joint is a slightly movable joint.
....
2. The shoulder joint is considered a freely movable joint.
....

7 What happens in case of ...?

1. Joints are not found in the human skeleton. *(North Sinai 2014)*
....
2. Knee joints become freely movable joints. *(Cairo 2019)*
....
3. Shoulder joints become from the slightly movable joints. *(Menofia 2012)*
....
4. All human bones are fixed with each other. *(Dakahlia 2017)*
....

8 Define:

1. Joints. *(Assiut 2017)*
2. Immovable joints.
3. Slightly movable joints.
4. Freely movable joints.

9 What is the importance or the function of each of the following?

1. Joints. *(Ismailia 2012)*
2. Freely movable joints.

10 Compare between ...:

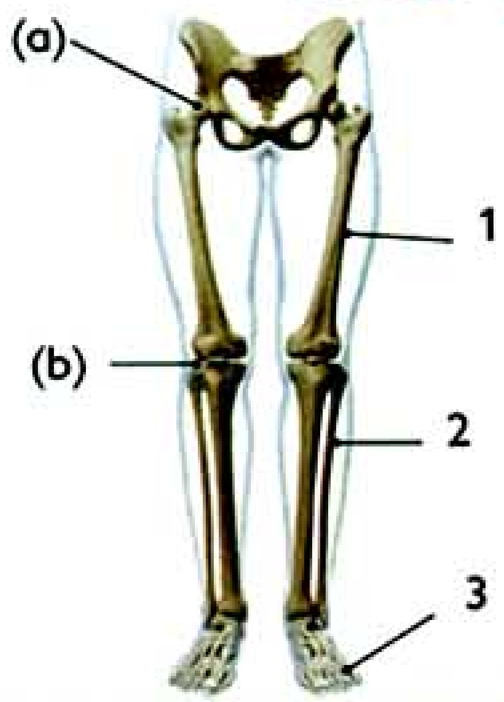
- Slightly movable joints and freely movable joints: *(Dakahlia 2016)*

Points of comparison	Slightly movable joints	Freely movable joints
Definition		
Examples		

11 Determine the type of the following joints:

1. Skull joints. *(Sohag 2012)* ( )
2. Wrist joints. ( )
3. Thigh joints. *(Ismailia 2013)* ( )

12 Look at the following figure, then answer: *(Sohag 2019)*



1. The figure represents the bones of .... limbs.
2. Label the numbered bones:
   1. ....
   2. ....
   3. ....
3. What is the function of the opposite part of the skeletal system?
4. Label the joints (a) and (b), then mention their types.

TIMSS Like Questions

2 on Lesson

Answer Guide: P. 24

1. The opposite diagram shows a human body system.



1- What are two of the functions performed by this body system?

a. protects and supports the body.

b. produces and transports oxygen within the body.

c. produces and excretes waste products.

b. controls and coordinates body activities.

2- Which human body system works directly together to allow locomotion?

a. circulatory, excretory and respiratory.

b. circulatory, endocrine and reproductive.

c. skeletal, muscular and nervous.

b. skeletal, digestive and respiratory.

2. The drawing shows the bones of the upper limbs.



(i). Name parts A, B and C:

(A): ....

(B): ....

(C): ....

(ii). Name the function of structure (C):

(iii). What happens if structure (C) does not exist?

3. Humans have skeletons:

a. What is a skeleton made from?

b. What are the functions of the skeleton?

Tick (✓) two correct answers:

(i) Helps us to move. ☐

(ii) Helps us to reproduce. ☐

(iii) Protects internal organs. ☐

(iv) Provides food. ☐

c. Which part of the skeleton protects our brain?

4. Make a model of the skeletal system using simple materials.

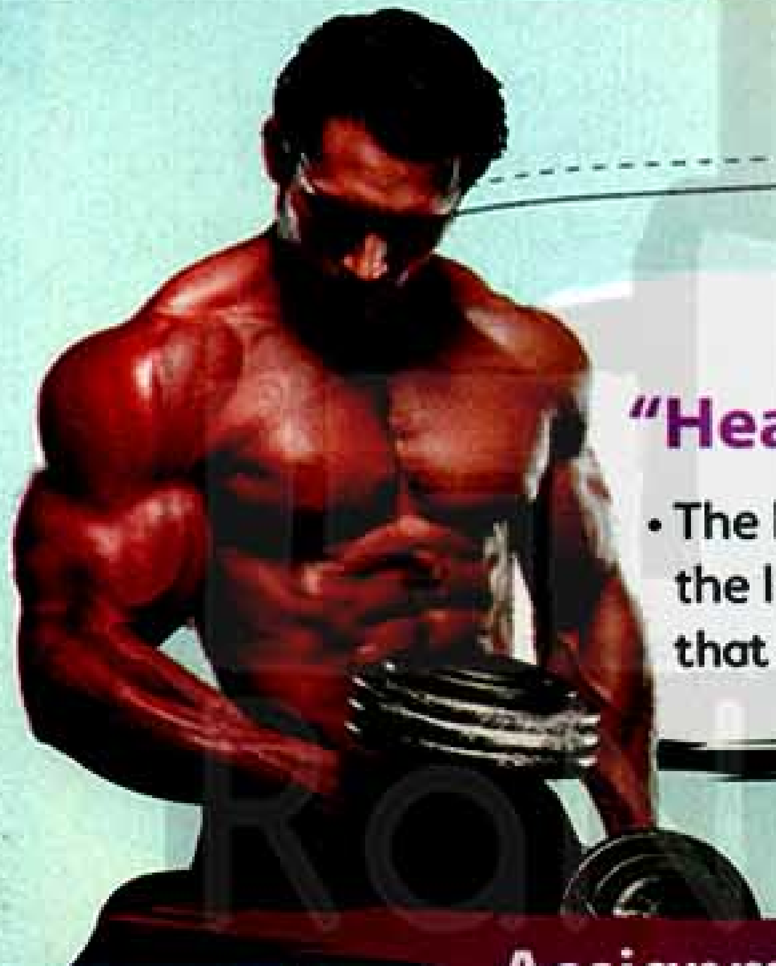
Unit 4 Think & Create

Assignment No. (1)

"Making models"

- Use simple environmental materials (a wooden board - paper - pencils - .....) to make a model of the skeletal system and present it in the science laboratory).





Assignment No. (2)

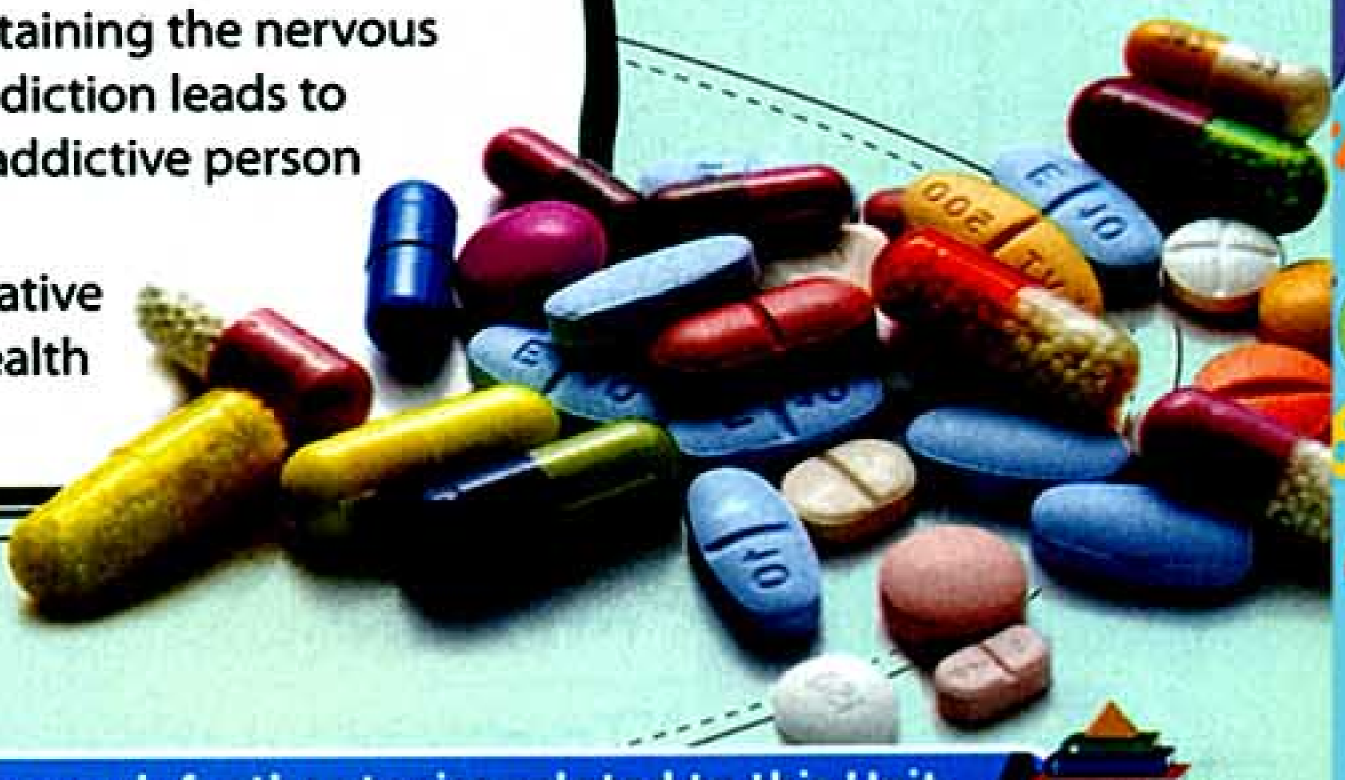
"Health issue"

- The human body requires practicing sports activities to maintain the locomotory system. Visit a gym to identify different mechanisms that can be trained in order to strengthen the locomotory system.

Assignment No. (3)

"Interesting topic"

- You have studied the importance of maintaining the nervous system and you have known that drug addiction leads to the total destruction of the health of the addictive person especially the nervous system.
- Search in the internet sites about the negative effects of drug addiction on the public health and the nervous system.



Visit Egyptian Knowledge Bank to research further topics related to this Unit.

AL ADWAA

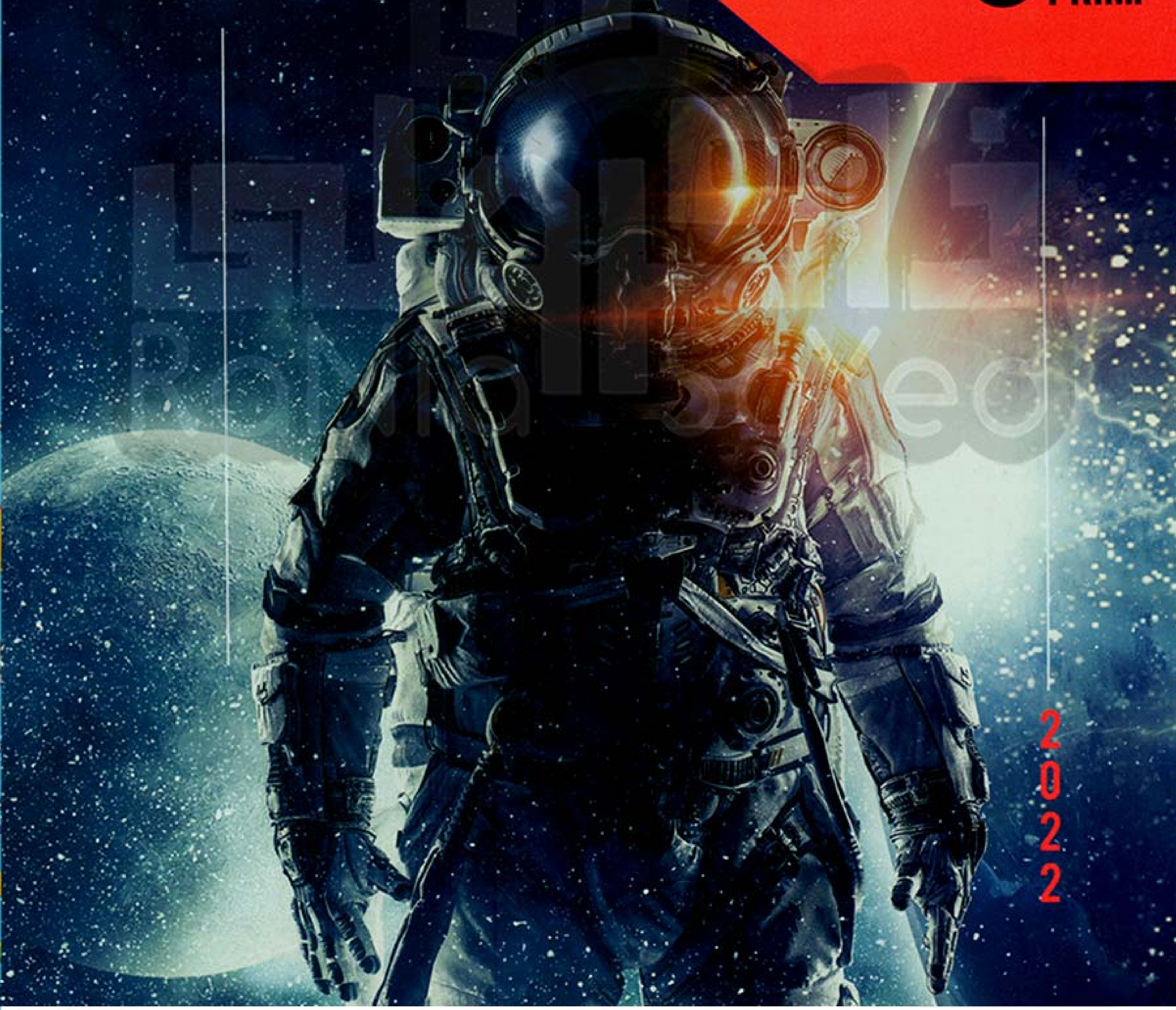
Gem

SCIENCE

FIRST TERM

6th PRIM.

Ongoing Assessment & Exams



2022

part (1)

Ongoing Assessment



Contents:

- Worksheets on each Lesson.
- School Book Exercises on each Unit.
- Al-Adwaa General Tests on each Unit.
- "Assess & Reflect" after each unit.

Unit 1 Force and Motion

Lesson 1 Mass and Weight

Answer Guide: P. 24

Worksheet 1

(Total mark) 20

1 (A) Complete the following sentences: 5m

1. The .... is the amount of matter in an object.
2. Mass is measured by different types of scales as .... and ....
3. .... and .... are the measuring units of mass.
4. The mass of an object .... when the amount of matter increases in it.
5. Mass is a constant value and it is not affected by changing ....
6. .... equals the mass of one liter of distilled water at normal temperature.

(B) Give a reason for each of the following:

1. The mass of an object on the earth is equal to its mass on the moon.

....

2. The balance scale should be placed horizontally on a stable shelf.

....

2 (A) Write the scientific term for each of the following: 5m

1. The measuring unit of mass which is suitable for measuring large masses. (....................)
2. The type of scales that is used to measure the mass of small objects as gold and chemicals. (....................)
3. The measurement unit of mass which is almost equal to mass of 1000 grams. (....................)

(B) Calculate the mass of water in the flask shown in the opposite figure.

....



Ongoing Assessment & Exams

3 (A) Correct the underlined words: 5m

1. The mass of a piece of stone on the earth is smaller than its mass on the moon. (..................)
2. Ton is suitable for measuring the mass of jewelry, while gram is suitable for measuring the mass of vegetables. (..................)
3. The mass of one liter of distilled water equals 100 grams. (..................)
4. Digital scale is used for measuring the weight an objects. (..................)

(B) What is the importance of ...?

1. Sensitive two-arm scale.

....

2. Balance scale.

....

4 (A) Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it: 5m

1. The mass of an object is measured in Newton that equals 1000 grams. (   )
2. Kilogram nearly equals the mass of one paper clip. (   )
3. Mass is measured by the spring scale. (   )
4. The mass of a body changes according to its place. (   )

(B) What is meant by...?

1. The mass of a gold ring is 3 grams.

....

2. The amount of wood in a chair is 4 kilograms.

....

Worksheet 2

(Total mark) 20

5m

1 **(A) Choose the correct answer:**

1. Newton equals the weight of an object whose mass is .... grams.
   a. 1 b. 10 c. 100 d. 1000
2. The weight of any body equals ....
   a. its mass b. its mass × 100 c. its mass ×10 d. its mass/100
3. When the mass of a desk is 20 kg, then its weight is ....
   a. 20 N b. 200 N c. 2 N d. 10 N
4. The planet on which a body's weight equals 6 times its weight on the moon is ....
   a. Mars b. Earth c. Jupiter d. Mercury

(B) Compare between the balance scale and the spring scale.

The balance scale	The spring scale
....	....
....	....
....	....

2 **(A) Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:**

5m

1. Gravity in space is zero, that's why astronauts are weightless. ( )
2. Newton is the measuring unit of weight. ( )
3. When the mass of an object on the earth equals 2 kg, its weight equals 200 N. ( )
4. By increasing the mass of a piece of stone, its weight decreases. ( )

(B) Give a reason for each of the following:

1. Astronauts are weightless in space.
   ....
2. The weight of a body in a balloon is smaller than its weight on earth.
   ....
3. The weight of an object changes according to the planet that the object exists on.
   ....

3 **(A) Correct the underlined words:** 5m

1. The weight of any object can be measured by the balance scale. (..................)
2. The mass of a piece of stone on the earth's surface is smaller than its mass on the moon's surface. (..................)
3. The effect of the weight is always directed towards the surface of the earth. (..................)
4. The reason that objects fall towards the earth is the mass. (..................)

(B) What happens if ...?

1. The mass of an object increases.

....

2. There is no gravity on the earth's surface.

....

3. The distance between a person in a balloon and the center of the earth increases.

....

4 **(A) Write the scientific term for each of the following:** 5m

1. The force by which a body is attracted to the Earth. (..................)
2. The measuring unit of weight that is almost equal to the weight of an object whose mass is 100 grams. (..................)

(B) Solve:

1. **If the mass of a body is 50 kg on the moon's surface, calculate:**
   a. Its weight on the earth.
   b. Its weight on the moon.
   c. Its mass on the earth.

....

2. **The mass of your new motorcycle is 250 grams. Calculate:**
   a. Its weight on the earth (in Newton).
   b. Its weight on the moon (in Newton).
   c. The mass of your motorcycle on the moon.

....

(Total mark) 20

Worksheet 3

5m

1 **(A) Complete the following sentences:**

1. The mass of any matter is .... value and it is not affected by changing ....
2. Mass is measured by .... scale,whereas weight is measured by .... scale.
3. An object's weight depends on ...., ... and ....
4. .... is used to measure very small masses.
5. The gravitational force .... as the body moves away from the Earth.

(B) Solve:

If the weight of your body on the earth's surface is 600 Newton. Calculate:

a. your mass on the earth's surface.
b. your mass on the moon's surface.
c. your weight on the moon's surface.

5m

2 **(A) Choose the correct answer:**

1. The mass of half distilled water .... grams.
   a. 5 b. 50 c. 500 d. 5000
2. If the weight of an object is 2 N, then its mass is ....
   a. 100 gm b. 200 gm c. 300 gm d. 20 gm
3. The weight of any object .... by increasing its mass.
   a. decreases b. increases
   c. remains constant d. no correct answer
4. If the mass of an object on the moon = 60 kg, then its weight on the earth = ...
   a. 60 kg b. 60 N c. 100 N d. 600 N

(B) What happens if ...?

1. The mass of an object decreases to half.
   ....
2. You hang a body in the bottom hook of the spring scale.
   ....
3. A body of 600 Newton weight is transferred from the earth's surface to the moon's surface.
   ....

3 **(A) What is the importance of each of the following...?** 5m

1. Earth gravity.

....

2. Balance scale.

....

3. Spring scale.

....

(B) A piece of rock is placed in a pan of double-pan balance. If the sum of masses which are placed in the other pan to make balance is 300 gm, complete the following:

1. The mass of the piece of rock is ....
2. The weight of the piece of rock is ....

4 **(A) What is meant by ...?** 5m

1. The weight of a body on the earth's surface = 400 Newton.

....

2. The gravitational force by which a body is attracted to the earth = 300 Newton.

....

(B) Give a reason for each of the following:

1. The weight of a person on the earth's surface is larger than his/her weight on the Moon's surface.

....

2. The weight of an object is not a fixed value but it differs from one place to another.

....

School BOOK Exercises on Unit 1

Answer Guide: P. 26

1 Choose the correct answer:

1. The device that is used for measuring weight is ....
   - a. one-arm scale
   - b. two-arm scale
   - c. digital scale
   - d. spring scale
2. An object whose weight is 20 Newton on the earth, its mass is equal to ....
   - a. 10 kg
   - b. 2 kg
   - c. 200 kg
   - d. 20 kg

2 Complete the following sentences:

1. Mass is measured by ...., whereas weight is measured by ....
2. Mass is the amount of matter that a body contains. It does not change according to ....
3. An object's weight depends on .... , ... and ....

3 Fill in the following table:

Points of comparison	Mass	Weight
Definition	....	....
Units of measurement	....	....
Devices of measurement	....	....
Direction	....	....
The effect of changing places	....	....

4 If an object's mass = 30 kg on the earth, calculate:

1. Its mass on the moon.

....

....

....

2. Its weight on the earth.

....

....

....

3. Its weight on the moon.

....

....

....

Al-Adwaa
General Tests on Unit 1

Answer Guide: P. 26

Test 1

(Total mark) 20

1 **(A) Write the scientific term for each of the following:** 5m

1. The device that is used for measuring the mass of an object. (..............................)
2. The amount of matter in an object. (..............................)
3. The force by which a body is attracted to the earth. (..............................)
4. The measurement unit of mass which is almost equal to the mass of 1 liter of distilled water. (..............................)
5. The measuring device of weight. (..............................)

(B) Compare between kilogram and Newton.

Points of comparison	Kilogram	Newton
Definition	....	....

2 **(A) Complete the following sentences:** 5m

1. The weight of an object on the moon's surface is equal to .... its weight on the earth's surface.
2. .... is suitable for measuring small masses,while .... is suitable for measuring large masses.
3. .... and .... are from the types of the two-arm scales.
4. The effect of weight is always directed towards ....

(B) What happens if ... ?

1. The mass of a planet where objects exist increases.
....
2. The distance between a person in a balloon and the center of the earth increases.
....
3. A body moves away from the center of the earth with regard to its mass.
....

Ongoing Assessment & Exams

3 **(A) Correct the underlined words:** 5m

1. The mass of your body on the earth is more than that on the moon. (..........)
2. The measurement unit of weight is the gram. (..........)
3. The grocer's scale is a spring scale. (..........)
4. The weight is inversely proportional to the mass. (..........)
5. The mass of a body depends on its distance from the earth's surface. (..........)

(B) If the weight of an object on the moon's surface is 60 N, calculate the mass and weight of this object on the earth.

....

....

....

4 **(A) Choose the correct answer:** 5m

1. .... equals the mass of one paper clip.
   a. Gram b. Newton c. Kilogram d. Liter
2. If your weight on the moon's surface is 50 N, then your weight on the earth's surface is ....
   a. 300 N b. 50 N c. 30 N d. 500 N
3. The acceleration of gravity of the earth (g) equals ....
   a. 100 m/s^2 b. 10 m/s^2 c. 5 m/s^2 d. 50 m/s^2
4. By increasing the distance between a person and the earth ....
   a. the weight of the person increases
   b. the gravitational force for this person decreases
   c. the weight of the person decreases
   d. (b) and (c)

(B) What is meant by ...?

1. Mass.

....

2. Weight.

....

(Total mark) 20

Test 2

1 **(A) Complete the following sentences:** 5m

1. The object whose mass is 300 grams on the earth's surface its weight equals ....
2. Mass is measured by ...., whereas weight is measured by ....
3. An object's weight depends on .... , ... and ....
4. The weight of any object on the .... planet equals 6 times its weight on the moon.

(B) Give a reason for each of the following:

1. The weight of an object is affected by its mass.

   ....
2. The mass of an apple is not equal to its weight.

   ....
3. The moon's gravity is less than the earth's gravity.

   ....

2 **(A) Write the scientific term for each of the following:** 5m

1. The device that is used to measure the mass of the chemical substances in the lab. (....................)
2. Weight/10. (....................)
3. The measurement unit of mass which is almost equal to a liter of distilled water. (....................)
4. The device that is used for measuring weight. (....................)
5. The device that is used for measuring mass. (....................)
6. The unit that is used for measuring weight. (....................)

(B) What happens in the following cases?

1. The mass of an object decreases.

   ....
2. There is no gravity on the earth's surface.

   ....

Ongoing Assessment & Exams

3 **(A) Correct the underlined words:** 5m

1. The extension of the wire of spring scale equals the mass of the object hung on it. (..............)
2. The object's mass on the moon is six times its mass on the Earth. (..............)
3. When the distance between an object and the center of its planet increases its weight increases. (..............)
4. The reason that objects fall towards the Earth is the mass. (..............)

(B) If an object's mass is 80 kg, calculate:

1. Its weight on the earth.

....

2. Its mass on the moon.

....

3. Its weight on the moon.

....

4 **(A) Choose the correct answer:** 5m

1. The mass of a liter of water is equal to ....
   a. 5 g   b. 50 g   c. 1000 g   d. 5000 g
2. The measurement tool of mass is ....
   a. kilogram   b. Newton   c. spring balance   d. balance scale
3. If the mass of a body on the moon is 20 kg, then its mass on the earth is ....
   a. 20 kg   b. 10 N   c. 60 kg   d. 60 N
4. Newton is equal to the weight of a body whose mass is ....
   a.1 g   b. 10 g   c. 100 g   d. 1000 g

(B) Compare between mass and weight:

Points of comparison	Mass	Weight
1. Units of measurement	....	....
2. Devices of measurement	....	....
3. Direction	....	....
4. The effect of changing place	....	....
5. Definitions	....	....

Unit 2 Thermal Energy

Lesson 1 Heat Conduction

Answer Guide: P. 27

Worksheet 4

(Total mark) 20

1 **(A) Complete the following sentences:** 5m

1. Heat transfers from the .... temperature object to the .... temperature object.
2. .... is the degree of hotness or coldness of a body.
3. Heat is a form of .... and can be measured by using ....
4. Wood is a .... conductor of heat, while iron is a .... conductor of heat.
5. Heat is important for many industries such as .... and ....

(B) Put (✓) or (✗):

1. All materials are good conductors of heat. (   )
2. Copper is a good conductor of heat. (   )
3. Iron conducts heat faster than aluminum. (   )

2 **(A) Write the scientific term for each of the following:** 5m

1. Materials that don't allow heat to flow through. (....................)
2. An indicator that helps us to express the state of a body from the point of hotness and coldness. (....................)
3. Materials that are used in making kettles and cooking pots. (....................)
4. An insulating material left between the two glass sheets of insulating glass windows. (....................)

(B) What happens if ...?

1. Two bodies have the same temperature touch each other.
....
2. Handles of cooking pots are made of aluminum.
....
3. All substances that man uses are good conductors of heat.
....

Ongoing Assessment & Exams

3 **(A) Choose the correct answer:** 5m

1. When you touch a cup of hot tea, ...
   a. heat transfers from the hand to the cup
   b. heat transfers from the cup to the hand
   c. heat does not transfer from or to the hand
   d. no correct answer
2. Temperature is measured by using a device called ....
   a. barometer b. thermometer c. voltmeter d. ammeter
3. Scientists classify the materials into ....
   a. heat insulators only b. heat conductors only
   c. (a) and (b) d. heat conductors and metals
4. All the following are bad conductors of heat except ....
   a. aluminum and iron b. glass and wool
   c. rubber and air d. wood and plastic

(B) Give a reason for each of the following:

1. Heat has great importance in industry.
   ....
2. Glass is a heat insulator, while copper is a heat conductor.
   ....
3. Copper differs from iron and aluminum in conducting heat.
   ....

4 **(A) Compare between heat conductors and heat insulators:** 5m

Points of comparison	Heat conductors	Heat insulators
1. Definition	....	....
2. Examples	....	....
3. Uses	....	....

(B) What is meant by ...?

1. Heat.
   ....
2. Thermometer.
   ....

Worksheet 5

(Total mark) 20

1 5m

(A) Complete the following sentences:

1. .... conducts heat faster than aluminum.
2. Handles of cooking utensils and kettles are made of .... or ....
3. .... is used in making heavy blankets and .... that keep the body warm.
4. To avoid train accidents, ... are left between railway bars.

(B) Correct the underlined words:

1. Copper, iron and <u>air</u> allow heat to transfer through them. (....................)
2. <u>Iron</u> is the fastest metal in conducting heat. (....................)
3. Different metals transfer heat with the <u>same</u> rate. (....................)

2 5m

(A) What happens if ...?

1. No gaps are left between railway bars.

....

2. You hold a cube of ice with your hand.

....

(B) Write the importance of...:

1. Aluminum and stainless steel.

....

2. Wood and plastic.

....

3. Heat energy.

....

3 5m

(A) Give a reason for each of the following:

1. Plastic is considered a bad conductor of heat.

....

2. Cooking pots are made of aluminum or stainless steel.

....

3. It is necessary to wear heavy woolen clothes in winter.

....

(B) Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. Heat is the degree of hotness or coldness of a body. ( )
2. Heat transfers from cold objects to hot objects. ( )
3. Air is a heat insulator. ( )
4. Wool and heavy blankets are used to keep the body warm because they are heat conductors. ( )

4 (A) Define each of the following: 5m

1. Heat conductors.

   ....

2. Temperature.

   ....

(B) Choose from column (A) what suits in column (B):

(A)	(B)
1. Aluminum	a. is used in making handles of kettles.
2. Wood	b. is used in making cooking pots.
3. Wool	c. keeps the body warm in winter.

1. .... 2. .... 3. ....

(C) Write the scientific term for each of the following:

1. The device that is used in measuring temperature. (....................)
2. Materials that do not let heat flow through. (....................)
3. A type of clothes used in winter to keep the body warm. (....................)
4. The form of energy that transfers from an object of high temperature to another object of low temperature. (....................)

Lesson 2

Measuring Temperature

Answer Guide: P. 28

Worksheet 6

(Total mark) 20

1 **(A) Complete the following sentences:** 5m

1. The liquid metal that is used in thermometer is ....
2. .... and .... are two kinds of thermometers.
3. We can use the .... thermometer to measure the temperature of human being.
4. The main idea of thermometers' working is changing the .... of liquid as the .... changes.
5. We cannot depend on the sense of .... to determine the temperature of our bodies.

(B) Choose the correct answer:

1. The bulb of the medical thermometer is filled with ....
   a. alcohol b. water c. mercury d. air
2. The medical thermometer is characterized than Celsius thermometer by the presence of ....
   a. constriction b. mercury bulb c. capillary tube d. scale
3. When the temperature of mercury increases, its .... regularly.
   a. volume decreases b. volume increases
   c. mass increases d. (b) and (c)
4. The temperature of liquid is measured by using ....
   a. thermostat b. medical thermometer
   c. Celsius thermometer d. no correct answer

2 **(A) Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:** 5m

1. Mercury is a good conductor of heat. (   )
2. Each degree in the medical thermometer is divided into 3 parts. (   )
3. The normal temperature of the healthy person is 35°C. (   )

(B) What happens if ...?

1. There is no constriction in the medical thermometer.

....

2. The clinical thermometer is put in boiling water.

....

Ongoing Assessment & Exams

3 **(A) Write the scientific term for each of the following:** 5m

1. The pa·t of medical thermometer that prevents mercury from going back to the bulb. (..........)
2. The part of the medical thermometer that is filled with mercury. (..........)
3. The liquid that is used to sterilize the medical thermometer. (..........)

(B) Give a reason for each of the following:

1. Mercury is used in making thermometer.

....

2. There is a constriction above the mercury bulb in the medical thermometer.

....

4 **(A) Choose from column (A) what suits in column (B):** 5m

(A)	(B)
1. Constriction	a. expands regularly by heating.
2. Glass bulb	b. kills microbes on the surface of the medical thermometer.
3. The mercury	c. prevents mercury from going back to the bulb easily.
4. Ethyl alcohol	d. is found in the medical thermometer and the Celsius thermometer.
5. Celsius	e. is the measuring unit of temperature.

1. .... 2. .... 3. .... 4. .... 5. ....

(B) Correct the underlined words:

1. Liquids expand by <u>cooling</u>. (..........)
2. One of mercury properties is that it gives a <u>narrow</u> range to temperature measurements. (..........)
3. The graduation of the Celsius thermometers ranges from <u>32</u> °C to 100 °C. (..........)
4. The melting point of ice is <u>100</u> °C. (..........)

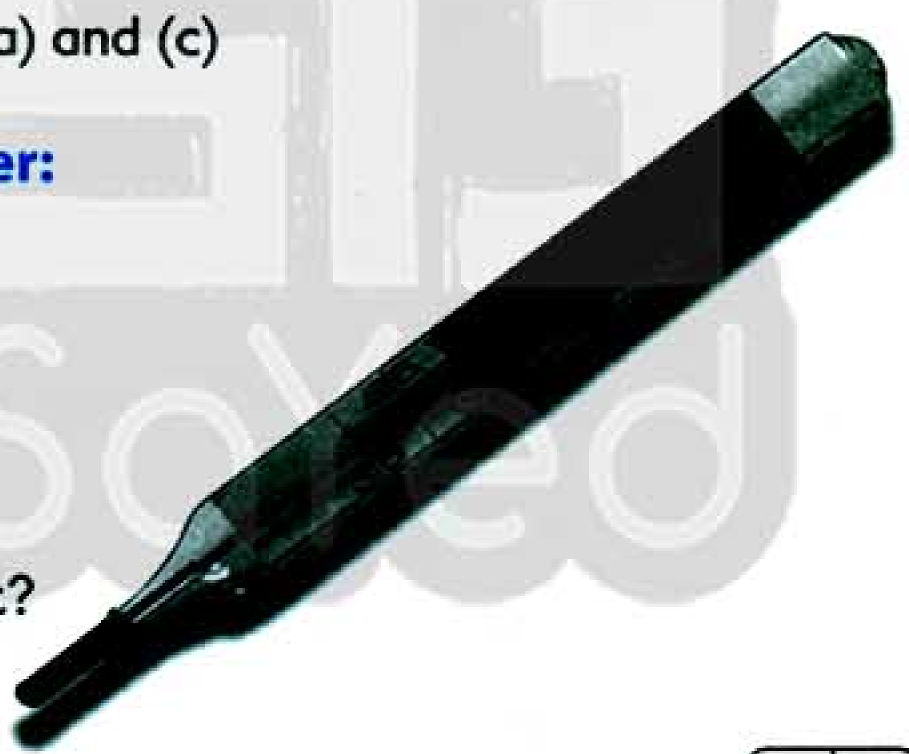
(Total mark) 20

Worksheet 7

1 **(A) Choose the correct answer:** 5m

1. Before using medical thermometer, we should shake it to ....
   a. clear it
   b. force the mercury back into the bulb
   c. sterilize it
   d. (a)and(b)
2. Mercury remains in a liquid state between .... °C.
   a. 39 : 357
   b. 39 : -357
   c. -39 : 357
   d. 0 : 100
3. Before using the clinical thermometer, we must sterilize it to ....
   a. warm mercury
   b. prevent mercury from returning easily
   c. force mercury back to the bulb
   d. kill microbes
4. Mercury is characterized by ....
   a. expanding regularly by heating
   b. expanding irregularly by heating
   c. contracting by heating
   d. (a) and (c)

(B) Look at the following figure, then answer:



1. What is the name of this device?
   ....
2. Mention the uses of this device.
   ....
3. What is the liquid which is used in making it?
   ....

2 **(A) Correct the underlined words:** 5m

1. The highest degree in the Celsius thermometer represents the degree of water <u>freezing</u>. (..............................)
2. The medical thermometer is used in measuring the temperature of <u>liquids</u>. (..............................)
3. To force mercury back to the bulb, we must <u>sterilize</u> the medical thermometer well. (..............................)

(B) Write the scientific term for each of the following:

1. A modern device used to measure the body's temperature especially for children. (..........)
2. The boiling point of water. (..........)
3. The type of thermometers graduated from 35°C to 42°C. (..........)

3 **(A) Give a reason for each of the following:** 5m

1. Do not seize the thermometer firmly with your teeth.
   ....
2. We cannot use the clinical thermometer in measuring the temperature of boiling water.
   ....
3. The thermometer must be kept out of reach of children.
   ....

(B) What happens if ...?

1. You use the medical thermometer without sterilizing it.
   ....
2. You use the medical thermometer without shaking it.
   ....
3. Mercury is replaced by water in making thermometers.
   ....

4 **(A) Compare between the medical thermometer and the Celsius thermometer:** 5m

Points of comparison	Medical thermometer	Celsius thermometer
1. Usage	....	....
2. Scale	....	....
3. Used liquid	....	....
4. Constriction	....	....

(B) Write the importance (use) of ...:

1. Mercury in thermometers.
   ....
2. Ethyl alcohol.
   ....

School BOOK Exercises on Unit 2

Answer Guide: P. 29

1 Complete the following sentences:

1. We measure temperature by using ....
2. .... is used in measuring temperatures of different liquids, whereas .... is used in measuring the temperature of the human body.
3. ...., ... and .... are good conductors of heat.
4. ...., ... and .... are bad conductors of heat.

2 Write the scientific term for each of the following statements:

1. The device that is used for measuring temperature. (................................)
2. The materials that allow heat to flow through. (................................)
3. The materials that do not allow heat to flow through. (................................)

3 Write the most important uses of the good and bad conductors of heat:

P.O.C.	Good conductors of heat	Bad conductors of heat
Uses	.... -	....

4 Fill the spaces in the following tables:

a)

Points of comparison	Medical thermometer	Celsius thermometer
Usage	....	....
Structure	....	....
Used liquid	....	....
Scale	....	....

Ongoing Assessment & Exams

b)

Points of comparison	Good conductors of heat	Bad conductors of heat
Definition	....	....
Usage	....	....
Examples	....	....

5 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

1. Medical thermometer is used in measuring the temperatures of different liquids. (   )
2. The scale of the Celsius thermometer starts from 35°C to 42°C. (   )
3. Aluminum is a bad conductor of heat. (   )
4. Wood is a good conductor of heat. (   )

6 Write an explanation for each of the following:

1. Mercury is used in thermometers.
....
2. The handles of cooking utensils are made of wood or plastic.
....
3. Cooking utensils are made of stainless steel or aluminum.
....
4. There is a constriction in the medical thermometer.
....

Al-Adwaa
General Tests on Unit 2

Answer Guide: P. 30

Test 1

(Total mark) 20

1 **(A) Complete the following sentences:** 5m

1. Temperature is considered as an indicator that helps us to express .... and .... of the body.
2. .... is a form of energy that transfers from a hot object to a cold object.
3. The scale of the medical thermometer starts from .... and ends at ....
4. Each degree in the scale of the medical thermometer is divided into .... parts.
5. Mercury is .... metal which is a .... conductor of heat.

(B) What is the main idea of making the thermometers?

....

....

2 **(A) Choose the correct answer:** 5m

1. Temperature of the human body is measured by the ....
   a. Celsius thermometer b. clinical thermometer
   c. thermostat d. (a) and (b)
2. The clinical thermometer is characterized from the Celsius thermometer by the presence of ....
   a. capillary tube b. glass bulb c. constriction d. (a) and (b)
3. When you touch a cube of ice, heat transfers from ....
   a. hand to ice b. ice to hand c. air to ice d. ice to air
4. All the following are bad conductors of heat except ....
   a. aluminum and iron b. glass and wool
   c. paper and air d. rubber and plastic
5. Aluminum conducts heat faster than ....
   a. copper b. iron c. glass d. (a) and (b)
6. The insulating glass windows are made up of ....
   a. two adhesive sheets of glass
   b. two sheets of glass with a space containing air in between
   c. a thin glass sheet
   d. a thin glass sheet containing water

(B) Give a reason for each of the following:

1. Gaps are left between railway bars.

....

2. The medical thermometer must be sterilized before using.

....

3 **(A) Write the scientific term for each of the following:** 5m

1. A type of thermometers graduated from 35°C to 42°C. (..............................)
2. The lower point of the Celsius thermometer that represents the melting point of ice. (..............................)
3. The liquid that is used in making thermometers. (..............................)
4. The best metal in conducting heat. (..............................)

(B) Write the importance of ...:

1. Thermometers. ....
2. Ethyl alcohol. ....

4 **(A) Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:** 5m

1. We cannot depend on the sense of touching to measure the temperature of patients. (   )
2. The scale of Celsius thermometer starts from 0°C to 100°C. (   )
3. The normal temperature of a healthy person is 39°C. (   )
4. Heat conductors allow heat to flow through them. (   )

(B) What happens if ...?

1. Handles of cooking pots are made of aluminum.

....

2. There is no constriction in the medical thermometer.

....

(Total mark) 20

Test 2

1 (A) Choose the correct answer: 5m

1. The liquid that is used in the manufacturing of thermometers is ....
   a. bromine b. colored water c. mercury d. no correct answer
2. The lower point of the Celsius thermometer is .... and it represents the melting point of ice.
   a. 100°C b. 50°C c. 0°C d. 37°C
3. .... is one of the examples of heat conductors.
   a. Wood b. Glass c. Iron d. Wool
4. To prevent the leakage of heat, insulating glass windows contain a layer of ....
   a. air b. water c. oil d. no correct answer
5. The thermometer whose scale ranges from 0°C to 100°C is ....
   a. the medical thermometer b. the Celsius thermometer
   c. (a) and (b) d. no correct answer

(B) Write the scientific term for each of the following sentences:

1. The form of energy that transfers from a hot body to a cold one. (............)
2. The device that is used to measure the temperature of the human body. (............)
3. The part of the medical thermometer that prevents mercury from returning to the bulb easily. (............)
4. Materials that do not let heat flow through. (............)

2 (A) Choose from column (A) what suits in column (B): 5m

(A)	(B)
1. Heat	a. is an indicator for the degree of hotness or coldness.
2. Ethyl alcohol	b. is the form of energy that transfers from an object of high temperature to an object of low temperature.
3. Temperature	c. is used in making of handles of kettles.
4. Wood	d. is used to sterilize the clinical thermometer.

1. .... 2. .... 3. .... 4. ....

(B) Give a reason for each of the following:

1. There is a constriction above the mercury bulb in the medical thermometer.
....
2. The thermometer must be kept out of reach of children.
....
3. Mercury gives a wide range to measure the temperature.
....

3 **(A) Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:** 5m

1. Wool and heavy blankets are used to keep the body warm because they are heat conductors. (   )
2. We cannot depend on the sense of touching to measure the temperature of patients. (   )
3. Before using the medical thermometer, we must sterilize it using water. (   )
4. All materials are good conductors of heat. (   )

(B) Look at the opposite figure, then answer:



1. This figure represents ....
2. Label the figure:
   1. ....
   2. ....
   3. ....
   4. ....
3. This device is used in ....

4 **(A) Correct the underlined words:** 5m

1. Celsius thermometers are used in measuring the temperature of the <u>human body</u>. (..................)
2. The degrees of heat conduction of all metals are <u>the same</u>. (..................)
3. Cooking pots are made of <u>plastic or wood</u>. (..................)
4. Mercury <u>contracts</u> regularly by heating. (..................)
5. The normal temperature of the healthy person is <u>35°C</u>. (..................)

(B) Why is mercury preferred in making thermometers?
....
....

Unit 3 The Atmosphere

Lesson 1 Oxygen

Answer Guide: P. 31

Worksheet 8

(Total mark) 20

1 **(A) Complete the following sentences:** 5m

1. .... are the main sources of the oxygen gas on the Earth's surface.
2. Oxygen gas molecule consists of .... atom(s).
3. The gas that represents 78% of air is ...., while .... represents 21%.
4. Oxygen is produced in the laboratory by decomposition of ....

(B) Give a reason for each of the following:

1. Although oxygen is consumed during respiration, its percentage remains stable in the atmosphere.

....

2. Oxygen is collected by downward displacement of water.

....

3. Manganese dioxide is added to hydrogen peroxide during oxygen preparation.

....

2 **(A) Write the scientific term for each of the following:** 5m

1. A mixture of different gases surrounding the earth's surface and attracted to it by gravity. (....................)
2. The catalyst that is used in oxygen preparation. (....................)
3. The gas that represents one fifth of the volume of atmosphere. (....................)
4. The process in which green plants take oxygen and produce carbon dioxide. (....................)

(B) Correct the underlined words:

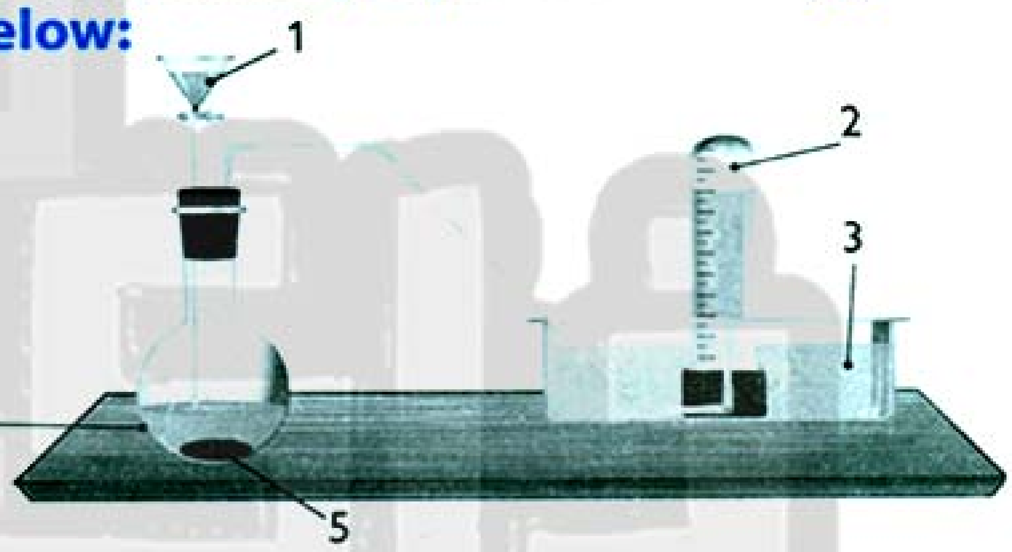
1. The decrease in the oxygen percentage is compensated through the <u>combustion</u> process. (....................)
2. Hydrogen peroxide dissociates in the presence of a catalyst into <u>nitrogen</u> and oxygen. (....................)
3. Oxygen is prepared by <u>upward</u> displacement of water. (....................)

Ongoing Assessment & Exams

3 **(A) Choose the correct answer:** 5m

1. Which of the following gases has a great percentage in the atmospheric air? – ....
   a. Oxygen b. Carbon dioxide c. Ozone d. Nitrogen
2. The gas that forms 0.03% of air is ....
   a. nitrogen b. oxygen c. carbon dioxide d. ozone
3. Photosynthesis process requires the presence of ....
   a. carbon dioxide gas b. light energy
   c. water and minerals d. all the previous answers
4. The chemical formula of oxygen molecule is ....
   a. O b. O_2 c. O_3 d. O_4

(B) Look at the opposite apparatus that is used in the preparation of oxygen in the lab, then answer the questions below:



1. Write the labels:
   1. ....
   2. ....
   3. ....
   4. ....
   5. ....
2. Write the function of no.5 and describe what happens to it at the end of the reaction. ....
3. How is oxygen collected? Why? ....

4 **(A) Define each of the following:** 5m

1. Photosynthesis process: ....
2. Catalyst: ....

(B) What happens if ...?

1. There is no atmosphere.
   ....
2. The percentage of oxygen decreases in air.
   ....
3. We don't use manganese dioxide in the preparation of oxygen gas.
   ....

(Total mark) 20

Worksheet 9

1 **(A) Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:** 5m

1. Oxygen gas is colorless, odorless and does not help in burning. ( )
2. Oxygen gas is heavier than air. ( )
3. The mass of a material decreases after combination with oxygen. ( )
4. Oxygen gas reacts with the burning magnesium forming a black powder. ( )
5. The ozone layer protects the earth from harmful radiations that come from the sun. ( )

(B) Mention the role of manganese dioxide in the preparation of oxygen:

....

....

2 **(A) Give a reason for each of the following:** 5m

1. Oxyacetylene flame is used in melting and cutting metals.

....

2. Oxygen cylinders are used during climbing mountains.

....

(B) Choose from column (A) what suits in column (B):

(A)	(B)
1. Catalyst	a. consists of 2 hydrogen atoms and 1 oxygen atom.
2. Ozone	b. is a white powder.
3. Magnesium oxide	c. helps hydrogen peroxide to decompose quickly.
4. Water molecule	d. protects the earth from the danger of harmful radiations.

1. .... 2. .... 3. .... 4. ....

3 **(A) Correct the underlined words:** 5m

1. Oxygen is used in the composition of the <u>ammonia</u> gas that protects the Earth. (..................)
2. Oxyacetylene flame is produced by burning of <u>methane</u> in the presence of <u>nitrogen</u>. (..................)
3. Oxygen is <u>very</u> soluble in water. (..................)
4. Rusting happens in the presence of <u>nitrogen</u> in the humid air. (..................)

(B) What happens in case of ...?

1. Leaving iron nails in moist air for a long time.

....

2. Bridges' pillars are not painted.

....

3. Putting a burning fragment in a cylinder filled with oxygen.

....

4 (A) Write the scientific term for each of the following: 5m

1. The substance that remains without any change in its quantity and properties during chemical reactions. (..............................)
2. The white substance which is formed when magnesium burns in oxygen. (..............................)
3. The gas that combines with oxygen to produce a flame to cut metals. (..............................)
4. A rabid union between oxygen and an element producing heat and light. (..............................)

(B) Choose the correct answer:

1. Ozone molecule is composed of .... oxygen atom(s).
   a. one b. two
   c. three d. four
2. The catalyst that is used in the preparation of oxygen in the lab is ....
   a. hydrogen peroxide b. calcium carbonate
   c. manganese dioxide d. calcium hydroxide
3. The temperature of oxyacetylene flame reaches .... °C.
   a. 35 b. 200 c. 3500 d. 350
4. When oxygen combines with an element, the mass of the product is .... the mass of the element.
   a. more than b. less than c. equal to d. double
5. .... gas is used with acetylene to weld metals.
   a. Nitrogen b. Oxygen c. Carbon dioxide d. Ozone

Lesson 2 Carbon Dioxide

Answer Guide: P. 32

Worksheet 10

(Total mark) 20

1 **(A) Correct the underlined words:** 5m

1. When the exhaled air passes through clear limewater, it becomes turbid forming a substance called calcium chloride. (..................)
2. Carbon dioxide molecule consists of one oxygen atom and two carbon atoms. (..................)
3. During photosynthesis process, oxygen gas is consumed. (..................)
4. The removal of forests leads to decreasing the level of carbon dioxide. (..................)

(B) Write the scientific term for each of the following:

1. The gas that raises the earth's temperature when its percentage increases in air. (..................)
2. The gas that forms 0.03% of the volume of the air. (..................)
3. The gas that is produced due to the burning of organic materials. (..................)

2 **(A) Choose the correct answer:** 5m

1. Carbon dioxide gas evolves by adding dilute hydrochloric acid to the powder of ....
   a. calcium oxide b. calcium hydroxide c. calcium carbonate d. calcium chloride
2. The gas which turns limewater turbid is .... gas.
   a. oxygen b. nitrogen c. carbon dioxide d. ozone
3. .... occurs due to the increase in the percentage of carbon dioxide gas in the air.
   a. Fermentation b. Oxidation c. Global warming d. Combustion
4. When adding lemon to sodium carbonate, ... evolves.
   a. oxygen b. nitrogen c. carbon dioxide d. ozone

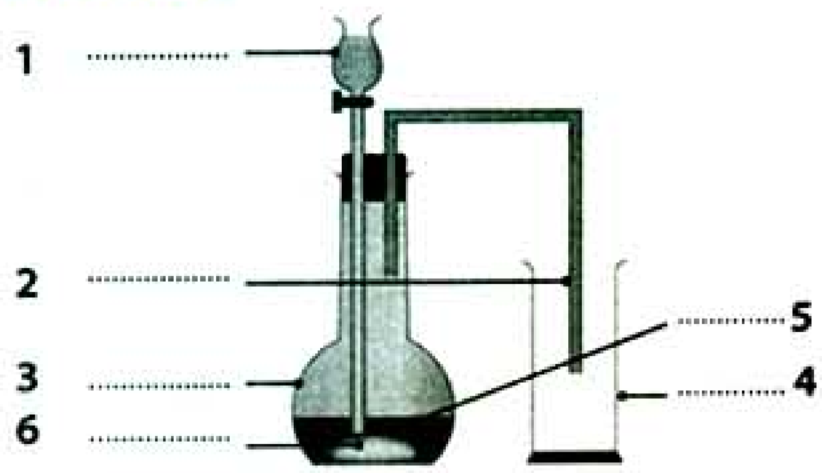
(B) Look at the opposite apparatus which is used in the preparing of carbon dioxide in the lab, then answer the questions below:

1. Write the labels.
2. How is this gas collected?

....

3. What happens if we put limewater in a cylinder containing carbon dioxide?

....



3 (A) What happens when ...? 5m

1. You blow in a jar that contains clear limewater.

....

2. The percentage of carbon dioxide gas in air decreases.

....

(B) Complete the following sentences:

1. Carbon dioxide gas is not collected by downward displacement of water because it ....
2. .... is used to detect the presence of carbon dioxide.
3. In .... process, green plants absorb carbon dioxide to make their own food.
4. Exhaled air contains a large amount of .... gas.
5. The gas which turns limewater turbid is .... gas.
6. Carbon dioxide gas is produced as a result of the combustion of .... substances and also produced from .... of living organisms.

4 (A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it: 5m

1. Oxygen is produced as a result of combustion of wood, tobacco and coal. (   )
2. Passing Carbon dioxide gas through clear limewater turns its color into blue. (   )
3. Man suffers from suffocation after breathing carbon dioxide gas. (   )

(B) Give a reason for each of the following:

1. Carbon dioxide gas is collected in the cylinder by upward displacement of air.

....

2. Clear limewater gets turbid if carbon dioxide passes through it.

....

(Total mark) 20

Worksheet 11

5m

1 (A) Complete the following sentences:

1. Carbon dioxide is used in making .... that is used in refrigeration.
2. Carbon dioxide gas is used in extinguishing fires as it doesn't burn and doesn't ....
3. Carbon dioxide gas is collected by .... displacement of .... as it is .... than air.
4. On putting a lighted magnesium ribbon in a cylinder filled with carbon dioxide a white substance of .... is formed.

(B) Write the scientific term for each of the following:

1. A black substance deposits on the wall of a cylinder when putting a lighted magnesium ribbon in the cylinder filled with CO_2. (....................)
2. The process performed by yeast releasing carbon dioxide. (....................)
3. The chemical substance that is used to prepare carbon dioxide in the lab. (....................)

5m

2 (A) Choose the correct answer:

1. Which of the following is from the uses of carbon dioxide gas? ....
   a. Cutting and welding of metals
   b. Formation of ozone layer
   c. Making dry ice
   d. Mechanical ventilation
2. When opening soft drinks, ... evolves.
   a. oxygen
   b. nitrogen
   c. carbon dioxide
   d. ozone
3. .... is used to prepare carbon dioxide.
   a. Hydrochloric acid
   b. Manganese dioxide
   c. Calcium carbonate
   d. All the previous answers
4. All the following are sources of carbon dioxide except ....
   a. fermentation
   b. fertilizers
   c. respiration
   d. combustion

(B) Match:

(A)	(B)	(C)
1. Photosynthesis	occurs in the bread industry	uses oxygen.
2. Respiration	releases carbon dioxide	uses carbon dioxide.
3. Fermentation	produces oxygen	happens by yeast.

3 **(A) Give a reason for each of the following:** 5m

1. Yeast is added to dough on making bread.
....
2. Green plants filter the air.
....
3. Clear limewater is used to detect the presence of carbon dioxide gas.
....

(B) Correct the underlined words:

1. Carbon dioxide dissolves <u>scarcely</u> in water.
....
2. Dilute hydrochloric acid reacts with <u>sodium chloride</u> to produce carbon dioxide.
....
3. Green plants consume <u>oxygen</u> gas during photosynthesis process.
....
4. A <u>black</u> precipitate is formed when carbon dioxide passes through clear limewater.
....

4 **(A) What happens if ...?** 5m

1. A lighted candle is put in a cylinder filled with carbon dioxide gas.
....
2. Lemon juice is added to sodium bicarbonate.
....
3. The pressure on liquefied carbon dioxide is relieved.
....

(B) How can we obtain carbon dioxide from calcium carbonate?
....
....

Lesson 3 Nitrogen

Answer Guide: P. 33

(Total mark) 20

Worksheet 12

1 **(A) Complete the following sentences:** 5m

1. Nitrogen is a chemical element found in nature in a .... state.
2. Nitrogen molecule consists of .... nitrogen atoms and its symbol is ....
3. Nitrogen is used in filling .... and some types of ....
4. Legumes form the protein with the help of a certain type of .... that live in ....

(B) Give a reason for each of the following:

1. Nitrogen is called lifeless gas.

....

2. All living organisms need nitrogen to live.

....

3. Nitrogen is used in the manufacturing of ammonia and ammonium nitrate.

....

2 **(A) Put (✓) in front of the right statement and (X) in front of the wrong one:** 5m

1. Nitrogen contributes in the composition of all living tissues. (   )
2. Nitrogen is a very important gas as it forms protein substances. (   )
3. Nitrogen gas easily dissolves in water. (   )
4. Nitrogen gas represents 78% of the air volume. (   )
5. Nitrogen is used to make stainless steel. (   )

(B) What happens in case of ...?

1. Killing soil bacteria.

....

2. The absence of nitrogen in the atmosphere.

....

Ongoing Assessment & Exams

3 **(A) Write the scientific term for each of the following:** 5m

1. The gas that contributes in the composition of proteins and tissues of living organisms. (..........)
2. The scientist who discovered nitrogen gas. (..........)
3. The most abundant gas in the atmosphere. (..........)
4. The main source of nitrogen gas. (..........)

(B) Choose the correct answer:

1. Nitrogen oxide is formed during the ....
   a. ammonia industry b. lightning
   c. bread industry d. fermentation
2. Which of the following gases has the greatest percentage in the atmospheric air? – ....
   a. Oxygen b. Nitrogen
   c. Carbon dioxide d. Water vapor

4 **(A) Compare between:** 5m

- Number of atoms in each of nitrogen molecule and carbon dioxide molecule.

P.O.C	Nitrogen molecule.	Carbon dioxide molecule
Number of atoms	....	....

(B) Correct the underlined words:

1. Car tires are filled with oxygen which keeps its volume constant at different temperature. (..........)
2. Nitrogen is also called azote which means life gas. (..........)
3. The nodular bacteria fix oxygen in the roots of leguminous plants. (..........)
4. Nitrogen molecule consists of three nitrogen atoms. (..........)
5. During lightning, nitrogen reacts with oxygen in the air forming carbon dioxide. (..........)

School BOOK Exercises on Unit 3

Answer Guide: P. 34

1 Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:

a. The nodular bacteria fix oxygen of air in the roots of leguminous plants such as beans and clover. ( )

b. Oxygen gas occupies 78% of the atmospheric air components. ( )

2 Justify:

- The clear limewater is used in the detection of carbon dioxide gas.

....

....

....

....

3 Explain how you get:

a. Oxygen gas from hydrogen peroxide.

....

....

....

....

b. Carbon dioxide gas from wood.

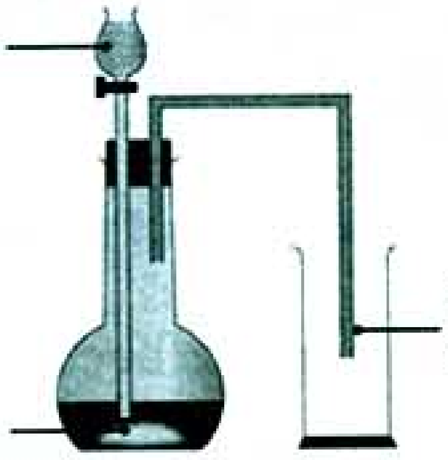
....

....

....

....

4 **Look at the opposite figure, then answer:**



1. Write what represents each label on the figure:

   - Substance (a): ....

   - Liquid (b): ....

2. Mention some uses of carbon dioxide gas:

   1. ....
   2. ....
   3. ....

Al-Adwaa
General Tests on Unit 3

Answer Guide: P. 34

Test 1

(Total mark) 20

1 **(A) Correct the underlined words:** 5m

1. The increase in oxygen percentage is responsible for global warming.
2. Oxyacetylene flame is produced by burning of methane in the presence of oxygen.
3. The slow combination of an element and oxygen gives light and heat.
4. Nitrogen turns limewater milky.
5. Fire extinguishers produce nitrogen to put out fires.

(B) Mention the name of the gas used in:

1. The manufacturing of gun powder. ....
2. Cutting and welding of metals. ....
3. Photosynthesis process. ....
4. Baking bread and cakes. ....
5. The composition of water. ....

2 **(A) Choose the correct answer:** 5m

1. The most abundant element in the earth's atmosphere is ....
   a. water b. nitrogen c. oxygen d. carbon dioxide
2. The element whose percentage is very little about 0.03% is ....
   a. water b. nitrogen c. oxygen d. carbon dioxide
3. .... is a form of oxygen with 3 oxygen atoms in each molecule.
   a. Ozone b. Nitrogen c. Oxygen d. Carbon dioxide
4. Which of the following gases form water molecule? – ....
   a. Hydrogen and oxygen b. Nitrogen and oxygen
   c. Oxygen and nitrogen d. Carbon dioxide and nitrogen

(B) Give a reason for each of the following:

1. Carbon dioxide gas is not collected by the downward displacement of water.
   ....
2. Nitrogen is used in filling car tires.
   ....

Ongoing Assessment & Exams

3 **(A) Look at the opposite apparatus and answer the questions below:** 5m



1. What happens to limewater in the jar after a while?

....

2. What is the process done by the germinated seeds?

....

(B) Write the importance of ...:

1. Catalyst. ....
2. limewater. ....
3. The oxyacetylene flame. ....

4 **(A) Put (✓) in front of the right statement and (X) in front of the wrong one, then correct it:** 5m

1. Oxygen is collected during its preparation in lab by upward displacement of air. (   )
2. Hydrogen peroxide works as a catalyst in the preparation of oxygen gas. (   )
3. The ozone layer protects the earth from the harmful radiations that come from the sun. (   )
4. Carbon dioxide gas is used in making dry ice and soft drinks. (   )
5. The atmosphere is attracted to the earth by the effect of gravity. (   )

(B) Compare between respiration and photosynthesis:

Points of comparison	Respiration	Photosynthesis
1. Gas consumed	....	....
2. Gas produced	....	....

(Total mark) 20

Test 2

1 **(A) Write the scientific term for the following:** 5m

1. The gas that combines with O_2 to produce a flame with high temperature that reaches 3500°C. (..................)
2. A rapid union of oxygen with an element producing heat and light. (..................)
3. The chemical substance that is used to detect (test) the presence of CO_2 gas. (..................)
4. The chemical substance that is added to calcium carbonate during the preparation of CO_2 gas. (..................)

(B) What happens in the following cases?

1. Nitrogen gas is not present in the atmosphere.
....
2. Oxygen reacts with nitrogen during lightning.
....
3. A lighted magnesium ribbon is put in a jar of carbon dioxide.
....

2 **(A) Choose from column (A) what suits in column (B):** 5m

(A)	(B)
1. Catalyst	a. protects the earth from harmful radiations.
2. Respiration	b. is made by yeast.
3. Ozone	c. contain nitrogen.
4. Fermentation	d. uses oxygen and releases carbon dioxide.
5. Fertilizers and nitrates	e. makes reactions faster without changing in its quantity or properties.

1. .... 2. .... 3. .... 4. .... 5. ....

(B) Give a reason for each of the following:

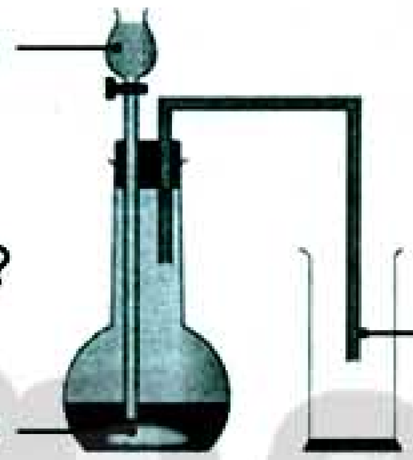
1. Iron nails rust when exposed to moist air.
....
2. Ozone layer is very important for the life of all living organisms.
....
3. Mountains climbers use oxygen cylinders.
....

3 **(A) Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:** 5m

1. Nitrogen gas is the most abundant gas in air. ( )
2. Carbon dioxide is heavier than air. ( )
3. Oxygen is used in soft drinks industry. ( )
4. Nitrogen gas is easily soluble in water. ( )

(B) Look at the opposite figure, then answer:

1. Write what each label represents:
   - Substance (a): ....
   - Liquid (b): ....



2. How can we detect the presence of carbon dioxide gas?

....

....

4 **(A) Correct the underlined words:** 5m

1. Carbon dioxide is produced during photosynthesis process. (..................)
2. Nitrogen gas represents 87% of the atmosphere volume. (..................)
3. Nitrogen is known as the life gas. (..................)
4. Ozone molecule consists of 4 atoms. (..................)

(B) Write the importance and uses of carbon dioxide.

....

....

Unit 4 Structure and Function of Living Organisms

Lesson 1 Human Nervous System

Answer Guide: P. 35

Worksheet 13

(Total mark) 20

1 **(A) Complete the following sentences:** 5m

1. .... is a communicating and controlling body system.
2. .... is the building unit of the nervous system.
3. The central nervous system consists of .... and ....
4. The two cerebral hemispheres contain the centers of .... and ....
5. The skull protects the ...., while the backbone protects ....

(B) Put (✓) in front of the right statement and (✗) in front of the wrong one:

1. The medulla oblongata is responsible for controlling the voluntary processes. (   )
2. Synapse is formed as a result of connection of nerve cell's axon. (   )
3. The spinal cord controls the heartbeats. (   )
4. The outer part of the brain is a white matter. (   )

2 **(A) Write the scientific term for each of the following:** 5m

1. The system which receives information from the environment and makes the body respond to it. (....................)
2. Branches extending from the body of the neuron. (....................)
3. A fatty layer covering the axons of neurons. (....................)
4. The outer layer of the two cerebral hemispheres. (....................)

(B) What happens in the following cases?

1. The absence of dendrites and axon terminals.

....

2. The medulla oblongata is damaged.

....

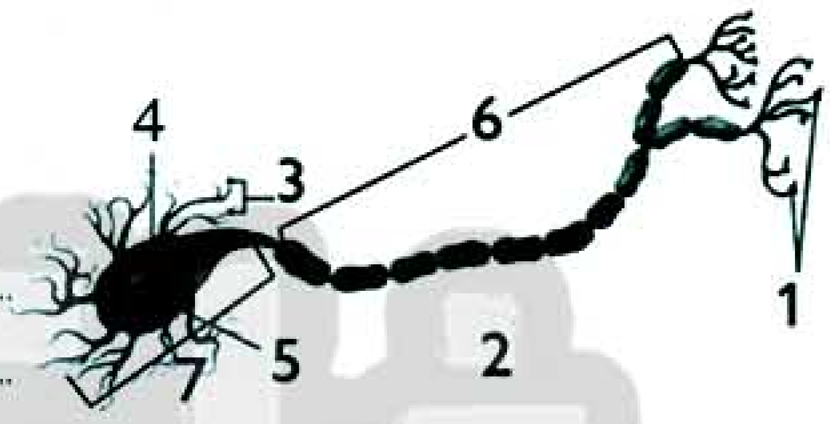
3. The cerebellum is shocked or infected.

....

3 (A) Choose the correct answer: 5m

1. The spinal cord is responsible for ....
   a. thinking b. the body's balance
   c. the reflex actions d. movement
2. The .... controls the voluntary movements such as running in a race.
   a. cerebrum b. cerebellum c. medulla oblongata d. spinal cord
3. Keeping the body balance during movement is the function of the ....
   a. cerebellum b. cerebrum c. medulla oblongata d. spinal cord
4. .... connect(s) the brain with the spinal cord.
   a. The cerebrum b. The cerebellum
   c. The medulla oblongata d. Axon terminals

(B) Look at the opposite figure, then answer:



1. This figure represents: ....
2. Label the figure. ....

1. .... 2. ....
3. .... 4. ....
5. .... 6. ....
7. ....

4 (A) Give a reason for each of the following: 5m

1. There are branches called dendrites which extend from the neuron's body.
....
2. The brain is the main control center in the human body.
....
3. Medulla oblongata keeps you alive during sleeping.
....

(B) Compare between the cerebrum and cerebellum:

Points of comparison	Cerebrum	Cerebellum
1. Description	....	....
2. Location	....	....
3. Function	....	....

(Total mark) 20

Worksheet 14

1 **(A) Complete the following sentences:** 5m

1. The nerves which emerge from the brain are called .... nerves and their number is .... pairs.
2. .... is a spontaneous response of the body to different stimuli.
3. Over intake of stimulating substances such as tea and coffee affects .... and ....
4. We must stay away from .... and .... to keep the nervous system healthy.

(B) Correct the underlined words:

1. The cranial nerves extend from the <u>spinal cord</u>. (........................)
2. The number of spinal nerves is <u>12</u> pairs. (........................)
3. The branches extending from the neuron's body are called <u>axon terminals</u>. (........................)

(C) What happens in the following cases...?

1. Over drinking of coffee and tea.
....
2. A human is exposed to noise constantly.
....

2 **(A) Write the importance of ...:** 5m

1. Skull.
....
2. The peripheral nervous system (nerves).
....

(B) Give a reason for each of the following:

1. Blinking of the eyelids when an object approaches the eye suddenly.
....
2. Avoid sitting for long periods in front of the computer.
....

3 (A) Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it: **5m**

1. To keep the nervous system healthy, we must stay away from tranquilizers and stimulants. (   )
2. The peripheral nervous system consists of 43 pairs of nerves. (   )
3. The neuron is the building unit of the nervous system. (   )
4. The white matter of the spinal cord has the shape of letter H. (   )
5. Dendrites are branches extending from the axon of neurons. (   )

(B) Define each of the following:

1. The neuron.

....

2. Cranial nerves.

....

(C) Mention some examples for the reflex action.

....

4 (A) Choose from column (A) what suits in column (B): **5m**

(A)	(B)
1. The brain	a. is located inside the backbone.
2. The spinal cord	b. extend from the brain.
3. Spinal nerves	c. extend from the spinal cord.
4. Cranial nerves	d. is located inside the skull.

1. .... 2. .... 3. .... 4. ....

(B) Compare between the brain and the spinal cord:

Points of comparison	Brain	Spinal cord
1. Description	....	....
2. Location	....	....
3. Function	....	....

Lesson 2 Human Locomotory System

Answer Guide: P. 36

Worksheet 15

(Total mark) 20

1 Choose the correct answer: 5m

1. All the following systems participate in the process of movement except the ....
   a. nervous system b. skeletal system
   c. muscular system d. digestive system
2. Human backbone consists of .... vertebrae.
   a. 12 b. 33 c. 43 d. 31
3. The .... protects the spinal cord.
   a. skull b. backbone c. femur d. humerus
4. Human rib cage protects the ....
   a. lungs b. heart c. spinal cord d. (a) and (b)
5. Femur bone belongs to the bones of ....
   a. upper limbs b. lower limbs c. backbone d. axial skeleton

2 (A) Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it: 5m

1. The locomotory system is the system that is responsible for applying movement. ( )
2. The axial skeleton consists of the skull, backbone and rib cage. ( )
3. The rib cage of human consists of 10 pairs of ribs. ( )

(B) What happens in the following cases ...?

1. Absence of cartilages between vertebrae of the backbone.
   ....
2. The backbone consists of one bone.
   ....

3 (A) Write the scientific term for each of the following: 5m

1. The system that is built up of the skeletal system and the muscular system. (..........)
2. A system consisting of the axial skeleton and appendicular skeleton. (..........)
3. A bone case containing cavities for eyes, ears and the nose. (..........)
4. The structure that allows the body to bend in different directions. (..........)
5. The first bone of the upper limb that is connected to the shoulder bone. (..........)

(B) Write the importance of ...:

1. Bones of the upper limbs.

....

2. Freely movable joints.

....

4 (A) Give a reason for each of the following: 5m

1. Upper limbs have great importance for the human body.

....

2. Presence of the brain inside the skull.

....

3. The rib cage surrounds the heart and lungs.

....

(B) Define each of the following:

1. The axial skeleton.

....

2. Joints.

....

Worksheet 16

(Total mark) 20

1 **(A) Complete the following sentences:** 5m

1. There are three types of joints which are ...., ... and ....
2. Knee joint is from .... joints, while shoulder joint is from .... joints.
3. .... helps in the processes of inhalation and exhalation.
4. The human locomotory system consists of .... and ....
5. The rib cage consists of .... pairs of ribs.

(B) Compare between the axial skeleton and the appendicular skeleton:

Point of comparison	Axial skeleton	Appendicular skeleton
Structure	....	....

2 **(A) Correct the underlined words:** 5m

1. Vertebral column consists of <u>35</u> vertebrae. (............)
2. The backbone protects the <u>sternum</u>. (............)
3. The shoulder joint is <u>an immovable</u> joint. (............)

(B) What happens in the following cases?

1. Shoulder joints become slightly movable joints.
....
2. The hip joint has a limited movement.
....
3. The absence of cartilages between vertebrae of the backbone.
....

3 **(A) Give a reason for each of the following:** 5m

1. There are cartilages between vertebrae.
....
2. Elbow joint is a slightly movable joint.
....
3. The backbone has great importance for the human body.
....

(B) Write the scientific term for each of the following:

1. The structure which consists of skull, backbone and rib cage. (..............................)
2. Areas between vertebrae of the vertebral column which separate and protect vertebrae from friction during movement. (..............................)
3. The joint which doesn't allow any movement. (..............................)

4 (A) Determine the type of the following joints: 5m

1. The knee joint.

....

2. The shoulder joint.

....

3. Skull joints.

....

4. The thigh joint.

....

(B) State the function of each of the following:

1. The skull.

....

2. The backbone.

....

3. The rib cage.

....

(C) Compare between backbone and rib cage.

Backbone	Rib cage
....	....
....	....

School BOOK Exercises on Unit 4

Answer Guide: P. 37

1 Choose the correct answer:

1. Myelin sheath surrounds the ....
   a. nerve cell axon b. cerebellum c. spinal cord
2. Reflex action takes place through the ....
   a. medulla oblongata b. cerebral hemispheres
   c. spinal cord
3. The joint is the location of meeting of ....
   a. two bones b. a muscle with a bone
   c. two muscles
4. Skull joints are ....
   a. immovable b. slightly movable c. freely movable

2 Write the scientific term for each of the following statements:

a. The building unit of the nervous system. (..................................)
b. The organ which consists of an internal H-shaped gray matter surrounded with a white matter. (..................................)
c. The autonomic body response towards different stimuli. (..................................)
d. The skeleton which includes the upper and lower limbs. (..................................)

3 Mention the location of the following parts in the human body:

a. Medulla oblongata.

....

b. The H-shaped gray matter.

....

c. The cerebellum.

....

d. The spinal cord.

....

4 State the importance of each of the following:

a. Joints.

....

b. Rib cage.

....

c. Cerebellum.

....

d. Cerebral hemispheres.

....

5 Give reasons:

a. The rapid withdrawal of the hand suddenly on touching thorns of a plant.

....

b. Damage of medulla oblongata may lead to death.

....

Al-Adwaa
General Tests on Unit 4

Answer Guide: P. 37

Test 1

(Total mark) 20

1 **(A) Complete the following sentences:** 5m

1. .... controls and regulates all the vital processes of the body.
2. .... is the ability of an organism to change its position from a place to another.
3. The axial skeleton consists of ...., ... and ....
4. The branches extending from the neuron's body are called ....
5. .... maintains the balance of the human body during movement.

(B) What is meant by ...?

1. Dendrites. ....
2. The cerebellum. ....
3. Freely movable joints. ....
4. The backbone. ....

2 **(A) Choose the correct answer:** 5m

1. The neuron is the building unit of the ....
   a. skeletal system b. nervous system
   c. muscular system d. locomotory system
2. All the following are parts of the brain except the ....
   a. cerebrum b. cerebellum
   c. medulla oblongata d. spinal cord
3. Elbow joint is from the .... joints.
   a. freely movable b. slightly movable
   c. immovable d. fully movable

(B) Give a reason for each of the following:

1. The joints between the bones of skull are immovable.
....
2. There are cartilages between the vertebrae of the backbone.
....

Ongoing Assessment & Exams

3 **(A) Write the scientific term for each of the following:** 5m

1. The communicating and controlling body system. (..................)
2. The part of the nervous system which is responsible for reflex actions. (..................)
3. Axis of the skeleton in the human body. (..................)
4. The part of the axial skeleton that helps in inhalation and exhalation processes. (..................)

(B) Write the importance of ...:

1. The medulla oblongata.

....

2. The skull.

....

4 **(A) Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:** 5m

1. The number of cranial nerves is 31 pairs. (   )
2. The first 10 pairs of ribs are connected anteriorly to the sternum. (   )
3. The rib cage of the human body consists of 12 pairs of ribs. (   )
4. Wrist joint is from the freely movable joints. (   )

(B) What happens if ...?

1. The cerebellum is shocked hardly.

....

2. The backbone consists of one bone.

....

(Total mark) 20

Test 2

1 **(A) Choose the correct answer:** 5m

1. All the following are from the constituents of the human skeletal system except ....
   a. skull
   b. rib cage
   c. backbone
   d. spinal cord
2. The myelin sheath surrounds the ....
   a. axon on the nerve cell
   b. spinal cord
   c. cerebellum
   d. brain
3. The human rib cage protects the ....
   a. heart
   b. lungs
   c. brain
   d. (a) and (b)
4. The joint which allows the movement in one direction only is called ....
   a. immovable
   b. freely movable
   c. slightly movable
   d. no correct answer

(B) Write the scientific term for each of the following:

1. The structure that allows the body to bend in different directions. (....................)
2. The nerve block which is located inside the skull. (....................)
3. The area at which two bones meet. (....................)

2 **(A) Choose from column (A) what suits in column (B):** 5m

(A)	(B)
1. The backbone	a. belongs to the bones of upper limbs.
2. The rib cage	b. belongs to the bones of lower limbs.
3. The forearm	c. protects the heart and lungs.
4. The leg	d. protects the spinal cord.

1. .... 2. .... 3. .... 4. ....

(B) Give a reason for each of the following:

1. The cerebrum is a very important part of the brain.

   ....

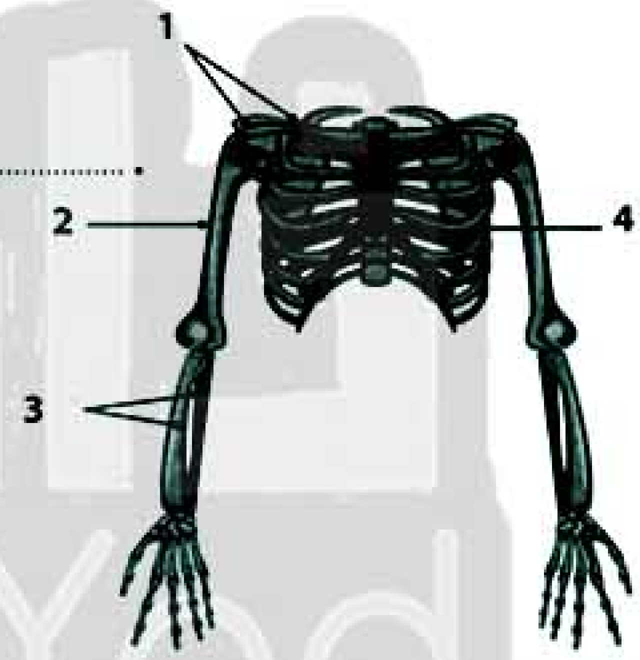
2. Upper limbs have great importance for the human body.

   ....

3 **(A) Put (✓) in front of the right statement and (✗) in front of the wrong one, then correct it:** 5m

1. Inhalation is the ability of the living organism to change its position from a place to another. ( )
2. Elbow joint is an immovable joint. ( )
3. The peripheral nervous system consists of 43 pairs of nerves. ( )
4. The skeleton of lower limbs consists of humerus, two forearm bones and bones of hands. ( )

(B) Look at the opposite figure, then answer:



1. The opposite figure represents the bones of ....
2. Label the figure:

   1. .... 2. ....

   3. .... 4. ....

3. What is the importance of the structure no. 3?

   ....

4 **(A) Correct the underlined words:** 5m

1. The organ that is responsible for the reflex action is the <u>cerebrum</u>. (..........................)
2. The internal gray matter of the spinal cord has the shape of letter <u>N</u>. (..........................)
3. From the examples of immovable joints are the joints between bones of the <u>backbone</u>. (..........................)

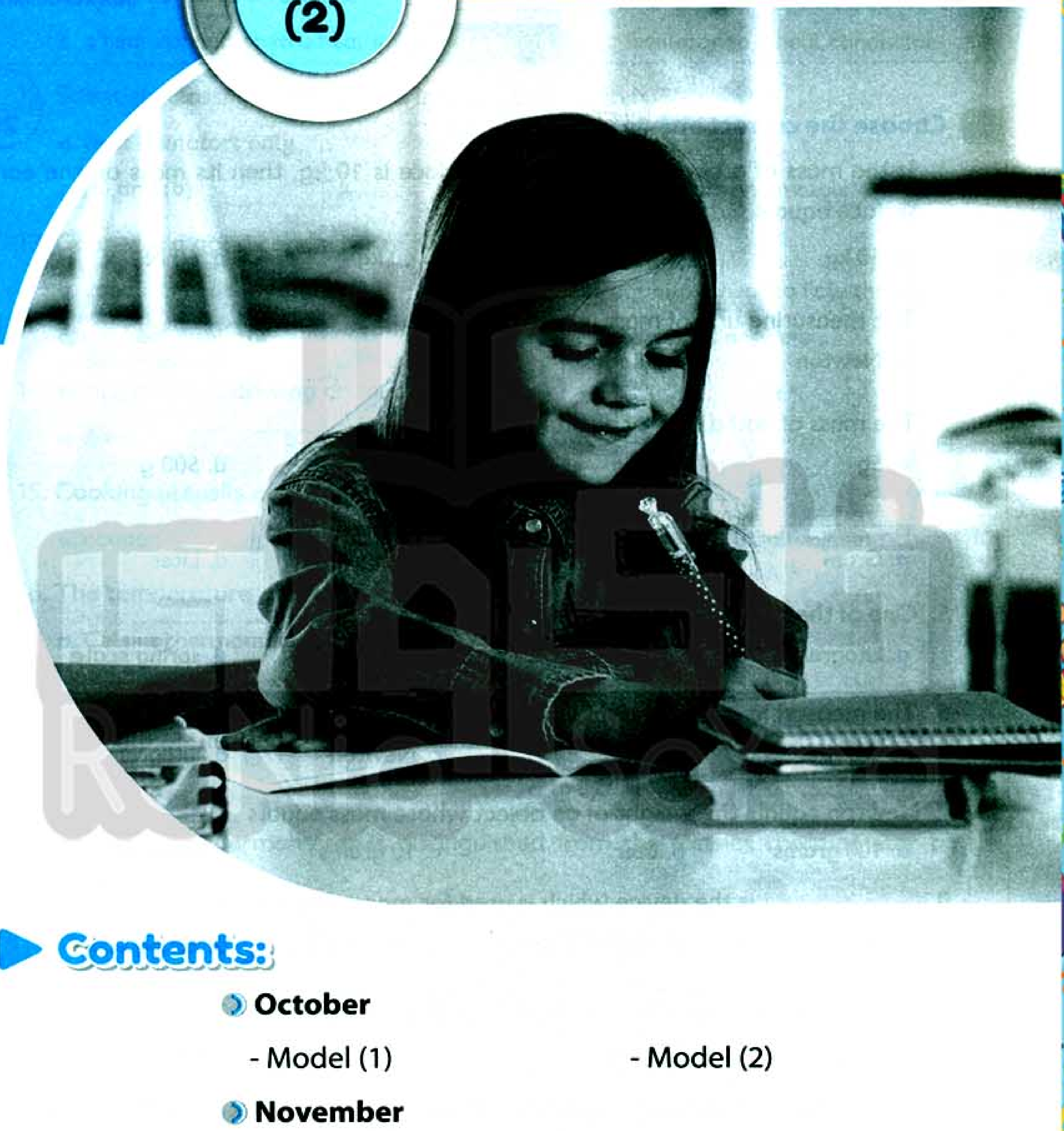
(B) Mention 3 ways to maintain the human nervous system healthy:

....

....

part (2)

Monthly Exams
on the First Term



Contents:

October Models

(Answer Guide P. 38)

Model 1

20

Choose the correct answer:

1. If the mass of a body on the moon's surface is 10 kg, then its mass on the earth's surface equals ....
   a. 10 kg b. 10 N c. 60 kg d. 60 N
2. The measuring unit of mass is ....
   a. Newton b. kilogram c. liter d. centimeter
3. The mass of half a liter of distilled water equals ....
   a. 5g b. 50 g c. 5000 g d. 500 g
4. .... equals the mass of one paper clip.
   a. Gram b. Newton c. Kilogram d. Liter
5. One of the tools that is used for measuring mass is the ....
   a. kilogram b. balance scale c. Newton d. spring scale
6. The measuring unit of weight is ....
   a. gram b. liter c. Newton d. kilogram
7. Newton equals the weight of an object whose mass equals ....
   a. 100 grams b. liter c. 10 grams d. kilogram
8. .... is the device which is used for measuring weight.
   a. One-arm scale b. Two-arm scale c. Digital scale d. Spring scale
9. The object which weighs 20 N on the earth, its mass equals ....
   a. 2 kg b. 10 kg c. 20 kg d. 200 kg
10. If an object's mass on the earth's surface is 6 kg, then its weight on the moon's surface is ....
    a. 6 kg b. 6 N c. 60 N d. 10 N

11. Heat transfers from ....

a. a hot object to a cold one
b. a cold object to a hot one
c. a heat conductor to a heat insulator
d. a heat insulator to a heat conductor

12. Scientists classify the materials into ....

a. heat insulators only
b. heat conductors only
c. (a) and (b)
d. heat conductors and metals

13. Copper is a good conductor of heat because it ....

a. conducts heat
b. does not allow heat to flow through
c. is a heat insulator
d. all the previous answers

14. Which of the following conducts heat faster? – ....

a. Iron
b. Aluminum
c. Copper
d. Glass

15. Cooking utensils are provided with handles of ....

a. copper
b. wood
c. iron
d. aluminum

16. The temperature of the human body is measured by the ....

a. Celsius thermometer
b. clinical thermometer
c. thermostat
d. (a) and (b)

17. The bulb of the medical thermometer is filled with ....

a. alcohol
b. water
c. mercury
d. air

18. The clinical thermometer is distinguished from the Celsius thermometer by the presence of a ....

a. capillary tube
b. glass bulb
c. constriction
d. (a) and (b)

19. We can measure the temperature of boiling water using the ....

a. medical thermometer
b. Celsius thermometer
c. thermostat
d. clinical thermometer

20. The lower point of the Celsius thermometer is .... and it represents the melting point of ice.

a. 100°C
b. 50°C
c. 0°C
d. 37°C

Model 2

20

1 Complete the following sentences: 5

1. The sensitive two-arm scale is used in measuring small masses as .... and ....
2. Objects seem .... inside spacecraft due to the absence of the gravity.
3. Temperature is considered as an indicator that helps us to express .... and .... of the body.
4. The scale of the medical thermometer starts from .... and ends at ....
5. Mercury is .... metal which is a .... conductor of heat.

2 Choose the correct answer: 5

1. If the weight of a person in a balloon on a certain height from the earth equals 60 N, then what is the weight of the person on the earth's surface? .... N.
   a. 55 b. 60
   c. 62 d. 58
2. The weight of a body whose mass is 200 g on the earth's surface nearly equals ....
   a. 2 N b. 20 N
   c. 200 N d. 2000 N
3. .... is the gravitational force acting on a body.
   a. Weight b. Newton
   c. Mass d. Kilogram
4. All the following are bad conductors of heat except ....
   a. aluminum and iron b. glass and wool
   c. paper and air d. rubber and plastic
5. Temperature of the human body is measured by the ....
   a. Celsius thermometer b. clinical thermometer
   c. thermostat d. (a) and (b)

3 **(A) Give a reason for each of the following:** 5

1. The weight of an object is affected by its mass.

 ....

2. The medical thermometer must be sterilized before using.

 ....

(B) If the weight of an object is 600 N on the earth, calculate:

1. Its mass on the earth.

 ....

2. Its mass on the moon.

 ....

3. Its weight on the moon.

 ....

4 **(A) What happens if ...?** 5

1. The mass of an object increases.

 ....

2. Handles of cooking pots are made of aluminum.

 ....

(B) Choose from column (A) what is suitable for column (B):

(A)	(B)
1. The gravitational force acting on a body's mass.	a. kilogram.
2. The measurement unit of a light body's mass.	b. spring scale.
3. The measurement tool of weight.	c. weight.
4. The amount of materials in an object.	d. weight increases.
5. By increasing the mass of the planet,	e. gram.
6. The measurement unit of a heavy body's mass.	f. mass.

1. .... 2. .... 3. .... 4. .... 5. .... 6. ....

November Models

20

Model 1

Choose the correct answer:

1. The most abundant element in the Earth's atmosphere is ....
   a. water b. nitrogen c. oxygen d. carbon dioxide
2. Oxygen gas represents .... of the Earth's atmosphere.
   a. 0.03% b. 21% c. 78% d. 12%
3. The main source of oxygen gas in air is produced from ....
   a. photosynthesis b. respiration c. combustion d. burning
4. Hydrogen peroxide decomposes in the presence of manganese dioxide into ....
   a. oxygen and hydrogen b. oxygen and water
   c. hydrogen and water d. hydrogen and manganese
5. .... gas is used with acetylene to weld metals.
   a. Oxygen b. Nitrogen
   c. Carbon dioxide d. Hydrogen
6. Photosynthesis process in plants depends on the presence of ....
   a. oxygen b. ozone
   c. carbon dioxide d. nitrogen
7. When the exhaled gas passes through clear limewater, it becomes turbid forming a substance called ....
   a. calcium carbonate b. calcium oxide
   c. calcium hydroxide d. carbon dioxide
8. Carbon dioxide gas is collected by the ....
   a. upward displacement of air b. upward displacement of water
   c. downward displacement of air d. downward displacement of water
9. We can extinguish fires using .... gas.
   a. carbon dioxide b. oxygen c. nitrogen d. hydrogen

10. Carbon dioxide gas is .... than air.

a. lighter b. heavier c. softer d. no correct answer

11. The molecule of nitrogen gas consists of .... of nitrogen.

a. one atom b. two atoms c. three atoms d. four atoms

12. Nitrogen is considered the main component of ....

a. carbohydrates b. fats c. proteins d. (a), (b) and (c)

13. Legumes such as peas produce proteins by the help of .... in their roots.

a. ammonia b. bacteria c. carbon dioxide d. (a) and (b)

14. The main source of nitrogen is ....

a. air b. water c. carbon dioxide d. (a) and (b)

15. Nitrogen is used to make .... which doesn't rust.

a. iron b. stainless steel c. aluminum d. copper

16. Oxygen reacts with nitrogen during lighting composing compounds known as ....

a. ozone b. nitrogen c. nitrogen oxide d. potassium hydroxide

17. Calcium carbonate is used in the preparation of ....

a. hydrogen b. oxygen c. nitrogen d. carbon dioxide gas

18. The gas which is used to fill some types of lamps is ....

a. oxygen b. nitrogen c. hydrogen d. carbon dioxide

19. Carbon dioxide gas is used in the industry of ....

a. steel b. gun powder c. fertilizers d. soft drinks

20. Why do mountain climbers use oxygen equipment at the top of the world's highest mountains?

a. Because there is little nitrogen in the air at great heights.
b. Because there is no air at the top of very high mountains.
c. Because there is less oxygen in the air at great heights.
d. no correct answer.

Ongoing Assessment & Exams

Model 2

20

1 **Complete the following sentences:** 5

1. Oxygen gas is collected by the displacement of .... downward because oxygen does not dissolve in water.
2. Magnesium reacts with carbon dioxide forming a white powder of .... and a black powder of ....
3. Nitrogen is a chemical element found in nature in a .... state.
4. Oxygen is consumed in .... and .... processes.
5. The removal of forests leads to the increase in the ratio of .... gas in air.

2 **Choose the correct answer:** 5

1. The most abundant element in the earth's atmosphere is ....
   a. water b. nitrogen
   c. oxygen d. carbon dioxide
2. The element whose percentage is very little about 0.03% is called ....
   a. water b. nitrogen
   c. oxygen d. carbon dioxide
3. .... is a form of oxygen with 3 oxygen atoms in each molecule.
   a. Ozone b. Nitrogen
   c. Oxygen d. Carbon dioxide
4. Which of the following gases form water molecule? – ....
   a. Hydrogen and oxygen b. Nitrogen and oxygen
   c. Oxygen and nitrogen d. Carbon dioxide and nitrogen
5. The gas which is used in the manufacturing of ammonia is ....
   a. nitrogen b. oxygen
   c. carbon dioxide d. hydrogen

3 **Write the scientific term for each of the following:** 5

1. The gas that combines with O_2 to produce a flame with high temperature that reaches 3500°C. (..................)
2. A rapid union of oxygen with an element producing heat and light. (..................)
3. The chemical substance that is used to detect (test) the presence of CO_2 gas. (..................)
4. The chemical substance that is added to calcium carbonate during the preparation of CO_2 gas. (..................)
5. The gas that is used in filling some types of lamps. (..................)

4 **(A) Mention the name of the gas used in:** 5

1. Manufacturing of gun powder.
....
2. Cutting and welding of metals.
....
3. Photosynthesis process.
....

(B) Give a reason for each of the following:

1. Carbon dioxide gas is not collected by the downward displacement of water.
....
2. Although oxygen is consumed during respiration, its percentage remains stable in the atmosphere.
....

December Models

20

Model 1

Choose the correct answer:

1. Dendrites are branches extending from the ....
   a. neuron's body b. axon of neuron c. spinal cord d. brain
2. Myelin sheath surrounds the ....
   a. nerve cell's axon b. cerebellum
   c. spinal cord d. cerebrum
3. All the following are parts of the brain except the ....
   a. cerebrum b. cerebellum
   c. medulla oblongata d. spinal cord
4. The outer surface of the two cerebral hemispheres is called the cerebral cortex and its color is ....
   a. red b. orange c. black d. gray
5. The five sensation centers are located in the ....
   a. two cerebral hemispheres b. cerebellum
   c. medulla oblongata d. spinal cord
6. The vertebral column is a series of vertebrae that protect the ....
   a. spinal cord b. cerebrum c. cerebellum d. (b) and (c)
7. The peripheral nervous system consists of ....
   a. 43 pairs of nerves b. 31 pairs of nerves
   c. 12 pairs of nerves d. 44 pairs of nerves
8. The .... controls the reflex actions.
   a. spinal cord b. cerebellum c. cerebrum d. brain
9. The .... connects the brain to the spinal cord.
   a. cerebrum b. cerebellum
   c. medulla oblongata d. axon terminals

10. The .... controls the voluntary movements such as running in a race.

a. cerebrum
b. cerebellum
c. medulla oblongata
d. spinal cord

11. The axial skeleton consists of all the following parts except the ....

a. skull
b. backbone
c. rib cage
d. upper limbs

12. The appendicular skeleton consists of the ....

a. upper limbs
b. lower limbs
c. backbone
d. (a) and (b)

13. The human backbone consists of .... vertebrae.

a. 12
b. 33
c. 43
d. 31

14. The human rib cage consists of .... pairs of ribs.

a. 43
b. 33
c. 12
d. 31

15. In the human rib cage, the first .... pairs of ribs are connected to the sternum bone.

a. 11
b. 10
c. 5
d. 12

16. .... is from the immovable joints.

a. Shoulder joint
b. Wrist joint
c. Skull joint
d. Elbow joint

17. Which of the following joints is a slightly movable joint? ....

a. The shoulder
b. The wrist
c. The ankle
d. The elbow

18. Which of the following joints is slightly movable? ....

a. The shoulder
b. The wrist
c. The elbow
d. The thigh

19. The femur bone belongs to the bones of the ....

a. upper limbs
b. lower limbs
c. backbone
d. axial skeleton

20. The location at which the bones meet together is called ....

a. tendon
b. joint
c. humerus
d. skull

Model 2

20

1 **Complete the following sentences:** 5

1. .... controls and regulates all the vital processes of the body.
2. .... is the ability of an organism to change its position from a place to another.
3. The axial skeleton consists of .... , ... and ....
4. The branches extending from the neuron's body are called ....
5. .... maintains the balance of the human body during movement.

2 **Choose the correct answer:** 5

1. The neuron is the building unit of the ....
   a. skeletal system
   b. nervous system
   c. muscular system
   d. locomotory system
2. All the following are parts of the brain except the ....
   a. cerebrum
   b. cerebellum
   c. medulla oblongata
   d. spinal cord
3. Elbow joint is from the .... joints.
   a. freely movable
   b. slightly movable
   c. immovable
   d. fully movable
4. The .... protects the spinal cord.
   a. skull
   b. backbone
   c. femur
   d. humerus
5. Human rib cage protects the ....
   a. lungs
   b. heart
   c. spinal cord
   d. (a) and (b)

3 **(A) Write the scientific term for each of the following:** 5

1. The communicating and controlling body system. (.................................)
2. The part of the nervous system which is responsible for reflex actions. (.................................)
3. Axis of the skeleton in the human body. (.................................)

(B) Write the importance of ... :

1. The medulla oblongata.

....

2. The skull.

....

4 **(A) Give a reason for each of the following:** 5

1. The joints between the bones of the skull are immovable.

....

2. There are cartilages between the vertebrae of the backbone.

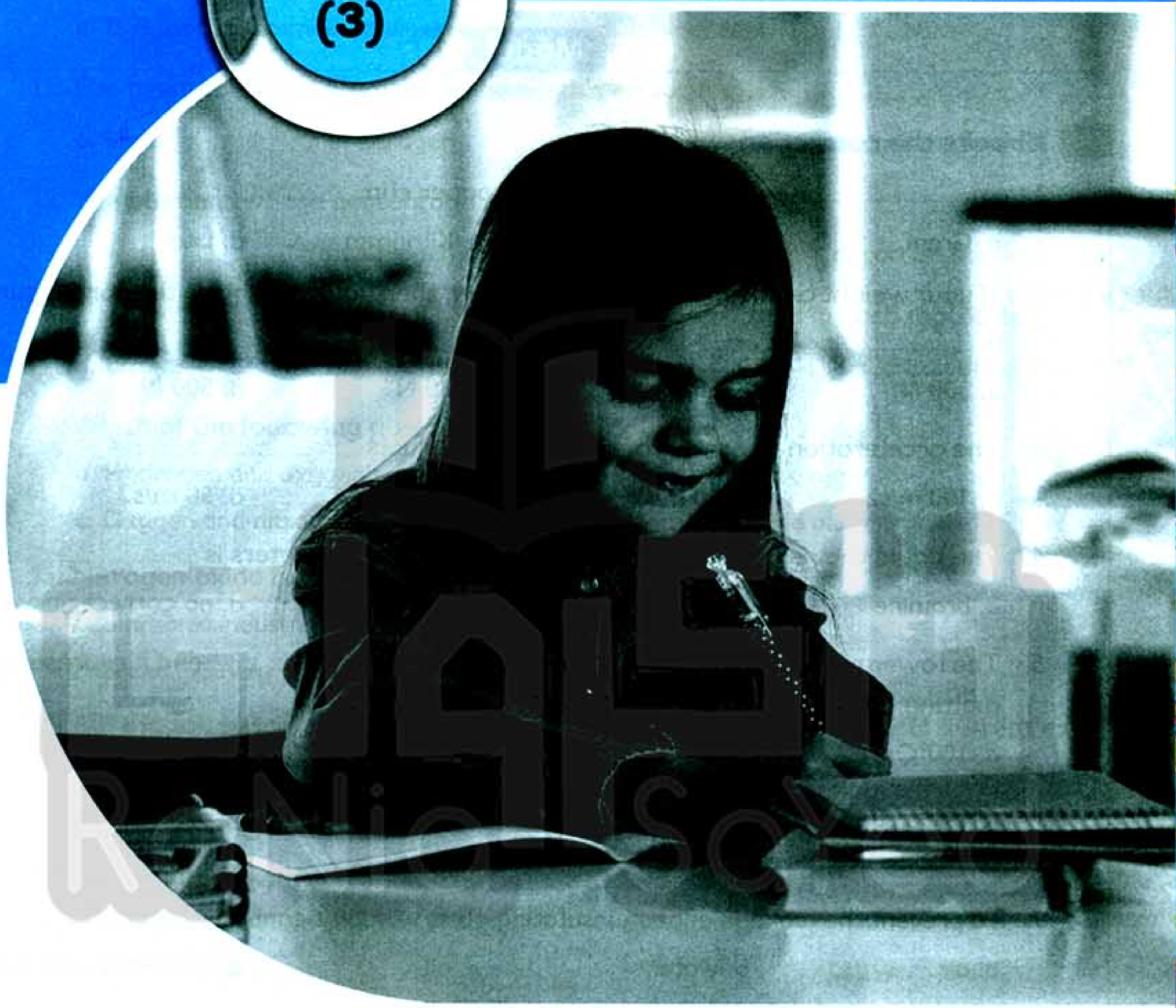
....

(B) Correct the underlined words:

1. The spinal cord controls the heartbeats. (.............................)
2. Bones of upper limbs are connected to the pelvic bones. (.............................)
3. The cranial nerves extend from the spinal cord. (.............................)

part (3)

Exams on the First Term



Contents:

Ongoing Assessment & Exams

Al-Adwaa MCQ Model Exams

(Answer Guide P. 40)

Model 1

Choose the correct answer:

1. .... equals the mass of one paper clip.
   a. Gram b. Newton c. Kilogram d. Liter
2. If your weight on the moon's surface is 50 N, then your weight on the earth's surface is ....
   a. 300 N b. 50 N c. 30 N d. 500 N
3. The acceleration of gravity of the earth (g) equals ....
   a. 100 m/s2 b. 10 m/s2 c. 5 m/s2 d. 50 m/s2
4. The liquid that is used in the manufacturing of thermometers is ....
   a. bromine b. colored water c. mercury d. no correct answer
5. The lower point of the Celsius thermometer is .... and it represents the melting point of ice.
   a. 100°C b. 50°C c. 0°C d. 37°C
6. .... is one of the examples of heat conductors.
   a. Wood b. Glass c. Iron d. Wool
7. To prevent the leakage of heat, insulating glass windows contain a layer of ....
   a. air b. water c. oil d. no correct answer
8. Circle the letter of the sentence that is true about nitrogen.
   a. It is called the life gas. b. It is found in fats.
   c. It is used in filling car tires. d. Its symbol is N3
9. Circle the letter of the sentence that is true about oxygen.
   a. It is needed by animals but not plants.
   b. It is needed to release energy from food.
   c. It is released by fuels when they burn.
   d. It has an acidic effect on litmus paper.

10. Circle the letter of the sentence that is true about carbon dioxide.
   a. It is not essential for life.
   b. It is given off by animals as a waste product.
   c. It is used by animals to digest food
   d. It is needed by fuels to burn

11. The most abundant element in the earth's atmosphere is ....
   a. water
   b. nitrogen
   c. oxygen
   d. carbon dioxide

12. The element whose percentage is very little about 0.03% is ....
   a. water
   b. nitrogen
   c. oxygen
   d. carbon dioxide

13. .... is a form of oxygen with 3 oxygen atoms in each molecule.
   a. Ozone
   b. Nitrogen
   c. Oxygen
   d. Carbon dioxide

14. Which of the following gases form water molecule? – ....
   a. Hydrogen and oxygen
   b. Nitrogen and oxygen
   c. Oxygen and nitrogen
   d. Carbon dioxide and nitrogen

15. Nitrogen oxide is formed during the ....
   a. ammonia industry
   b. lightning
   c. bread industry
   d. fermentation

16. All the following are from the constituents of the human skeletal system except ....
   a. skull
   b. rib cage
   c. backbone
   d. spinal cord

17. The myelin sheath surrounds the ....
   a. axon on the nerve cell
   b. spinal cord
   c. cerebellum
   d. brain

18. The human rib cage protects the ....
   a. heart
   b. lungs
   c. brain
   d. (a) and (b)

19. The joint which allows the movement in one direction only is called ....
   a. immovable
   b. freely movable
   c. slightly movable
   d. no correct answer

20. The neuron is the building unit of the ....
   a. skeletal system
   b. nervous system
   c. muscular system
   d. locomotory system

Model 2

Choose the correct answer:

1. The mass of half a liter of water equals ....
   a. 5 g b. 50 g c. 5000 g d. 500 g

2. If your weight on the earth's surface is 600 N, then it is .... on the moon's surface.
   a. 6 N b. 60 N c. 100 N d. 10 N

3. If the mass of an object on the moon = 60 kg, then its weight on the earth = ...
   a. 60 Kg b. 60 N c. 100 N d. 600 N

4. All the following substances are good conductors of heat except ....
   a. iron b. copper c. plastic d. aluminum

5. Wool is considered ....
   a. a heat insulator b. a heat conductor
   c. a good conductor of heat d. (b) and (c)

6. Celsius is the measurement unit of ....
   a. weight b. temperature c. volume d. mass

7. The melting point of ice is ....
   a. 0°C b. 100°C c. 37°C d. 42°C

8. When oxygen combines with an element, the mass of the product is .... the mass of the element.
   a. more than b. less than c. equal to d. double

9. Oxygen combines with lighted magnesium forming a white material called ....
   a. iron oxide b. magnesium oxide
   c. magnesium dioxide d. manganese dioxide

10. The chemical structure of carbon dioxide gas is ....
    a. O_2 b. H_2O c. CO d. CO_2

11. .... happens when carbon dioxide percentage increases, causing the earth's temperature to increase.

a. Fermentation b. Oxidation c. Global warming d. Combustion

12. During lightning, ... is formed.

a. nitrogen oxide b. copper oxide c. carbon dioxide d. magnesium oxide

13. Fertilizers contain ....

a. ozone b. ammonia

c. ammonia and carbon dioxide d. magnesium oxide

14. When oxygen combines rapidly with elements and produces heat and light, this union is called ....

a. combustion b. oxidation c. neutralization d. decomposition

15. Photosynthesis process in plants depends on the presence of ....

a. oxygen b. ozone c. carbon dioxide d. nitrogen

16. The .... controls the voluntary movements such as running in a race.

a. cerebrum b. cerebellum

c. medulla oblongata d. spinal cord

17. The vertebral column is a series of vertebrae that protect the ....

a. spinal cord b. cerebrum c. cerebellum d. (b) and (c)

18. The number of spinal nerves is .... pairs.

a. 31 b. 12 c. 21 d. 43

19. The .... protects the spinal cord.

a. skull b. backbone c. femur d. humerus

20. The human rib cage consists of .... pairs of ribs.

a. 43 b. 33 c. 12 d. 31

Ongoing Assessment & Exams

Model 3

Choose the correct answer:

1. The measuring unit of mass is ....
   a. Newton b. kilogram c. liter d. centimeter
2. If the weight of a body is 2 N, then its mass is ....
   a. 0.2 g b. 20 g c. 200 g d. 2 g
3. The weight of an object that is 40 kg equals ....
   a. 40 N b. 400 N c. 4 N d. 4000 N
4. Aluminum conducts heat faster than ....
   a. copper b. iron c. glass d. (a) and (b)
5. Which of the following conducts heat faster? – ....
   a. Iron b. Aluminum c. Copper d. Glass
6. All the following are among the properties of mercury as a thermometric substance except that ....
   a. it is a good conductor of heat
   b. its expansion is regular
   c. it gives a limited extent to measure the temperature
   d. it does not stick to the walls of the capillary tube
7. Mercury remains in the liquid state between .... °C.
   a. 39 : 357 b. 39 : –357 c. –39 : 357 d. 0 : 100
8. When adding lemon to sodium bicarbonate, ... evolves.
   a. ozone b. nitrogen c. oxygen d. carbon dioxide
9. Respiration and combustion processes consume .... gas.
   a. oxygen b. nitrogen c. argon d. carbon dioxide
10. Carbon dioxide gas is collected by the ....
    a. upward displacement of air b. upward displacement of water
    c. downward displacement of air d. downward displacement of water

11. .... is formed when burning cigarettes.
   a. Ozone b. Nitrogen c. Oxygen d. Carbon dioxide

12. Carbon dioxide is used in ....
   a. making dry ice
   b. making soft drinks
   c. extinguishing fires
   d. (a), (b) and (c)

13. The molecule of nitrogen gas consists of .... of nitrogen.
   a. one atom b. two atoms c. three atoms d. four atoms

14. The scientist who discovered nitrogen gas was ....
   a. Celsius b. Priestley c. Rutherford d. Lavoisier

15. Nitrogen is used in the manufacturing of ....
   a. soft drinks b. dry ice c. fertilizers d. fire extinguisher

16. The .... system interprets the external stimuli and makes the body respond to them.
   a. digestive b. respiratory c. nervous d. circulatory

17. The nerve cell consists of ....
   a. nucleus
   b. cytoplasm
   c. plasma membrane
   d. (a), (b) and (c)

18. .... is/are from the reflex actions.
   a. Heartbeats
   b. Eating when we are hungry
   c. Blinking of eyelids when something comes close to them
   d. All the previous answers

19. All the following systems participate in the process of movement except the ....
   a. nervous system
   b. skeletal system
   c. muscular system
   d. digestive system

20. Among the freely movable joints are .... joints.
   a. knee b. thigh c. elbow d. joints of the skull

Model 4

Choose the correct answer:

1. All the following scales are examples of scales that are used to measure mass except the ....
   a. one-pan scale b. balance scale
   c. spring scale d. sensitive two-pan scale

2. .... is the gravitational force acting on a body's mass.
   a. Weight b. Mass c. Newton d. Kilogram

3. The weight of any object .... by increasing its mass.
   a. remains constant b. decreases c. increases d. no correct answer

4. Heat transfers from ....
   a. a hot object to a cold one b. a cold object to a hot one
   c. a heat conductor to a heat insulator d. a heat insulator to a heat conductor

5. When you touch a cup of hot tea, heat transfers from ....
   a. the hand to the cup b. the cup to the hand
   c. (a) and (b) d. otherwise

6. We can measure the temperature of boiling water using the ....
   a. medical thermometer b. Celsius thermometer
   c. thermostat d. clinical thermometer

7. Before using the medical thermometer, we shake it to ....
   a. sterilize it b. clean it from dust
   c. force mercury to go back to the bulb d. (a) and (b)

8. .... is a gas that contributes in composing gunpowder. (Suez 2014)
   a. Oxygen b. Carbon dioxide c. Nitrogen d. Argon

9. The gas which is used to fill some types of lamps is ....
   a. oxygen b. nitrogen c. hydrogen d. carbon dioxide

10. When adding lemon to sodium bicarbonate, ... evolves.

a. ozone b. nitrogen c. oxygen d. carbon dioxide

11. Carbon dioxide .... dissolves in water.

a. scarcely b. easily c. never d. extremely

12. Clear limewater is calcium ....

a. carbonate b. hydroxide c. oxide d. metal

13. Rust is the .... layer formed when iron and oxygen react in humid air.

a. magnesium oxide b. iron oxide c. white d. hydrogen peroxide

14. Bridges are covered with .... to protect them from rusting.

a. alkaline b. acid c. wax d. paint

15. .... protects the earth from ultraviolet radiations.

a. Ozone b. Nitrogen c. Oxygen d. Carbon dioxide

16. All the following systems participate in the process of movement except the ....

a. nervous system b. skeletal system
c. muscular system d. digestive system

17. The axial skeleton consists of all the following parts except the ....

a. skull b. backbone c. rib cage d. upper limbs

18. The .... connect(s) the brain to the spinal cord.

a. cerebrum b. cerebellum
c. medulla oblongata d. axon terminals

19. The brain is protected by the ....

a. skull b. backbone
c. vertebral column d. (a) and (b)

20. Centers of thinking and memory are located in the ....

a. medulla oblongata b. cerebrum
c. cerebellum d. spinal cord

Model 5

Choose the correct answer:

1. The weight of any object .... when the distance between the body and the center of the Earth increases.
   a. remains constant
   b. decreases
   c. increases
   d. no correct answer

2. The weight of an object on .... equals 6 times its weight on the moon's surface.
   a. Mars
   b. Earth
   c. Jupiter
   d. Neptune

3. If an object's mass on the earth's surface is 6 kg, then its weight on the moon's surface is ....
   a. 6 kg
   b. 6 N
   c. 60 N
   d. 10 N

4. The degree of hotness or coldness of a body is called ....
   a. heat
   b. temperature
   c. thermometer
   d. magnetism

5. Heat conductors are used in ....
   a. making of kettles
   b. making of cooking pots
   c. making of handles of kettles
   d. (a) and (b)

6. Each degree in the medical thermometer is divided into .... parts.
   a. 3
   b. 5
   c. 6
   d. 10

7. Before using the clinical thermometer, we must sterilize it to ....
   a. warm the mercury
   b. prevent mercury from returning easily
   c. force the mercury to go back to the bulb
   d. kill microbes

8. Nitrogen is used to make ....
   a. thermometers
   b. steel
   c. soft drinks
   d. all the previous answers

9. The main source of nitrogen is ....
   a. air
   b. water
   c. carbon dioxide
   d. (a) and (b)

10. All the following are organic compounds except ....
   a. manganese dioxide
   b. coal
   c. wood
   d. gasoline

11. The gas which makes limewater turbid is ....
   a. oxygen
   b. nitrogen
   c. carbon dioxide
   d. hydrogen

12. The chemical formula of oxygen molecule is ....
   a. CO_2
   b. O_2
   c. O_4
   d. O_3

13. Hydrogen peroxide decomposes in the presence of manganese dioxide to ....
   a. oxygen and hydrogen
   b. oxygen and water
   c. hydrogen and water
   d. hydrogen and manganese

14. Oxygen is collected by the .... displacement of ....
   a. upward-water
   b. downward-air
   c. downward-water
   d. upward-air

15. .... gas is prepared by adding dilute hydrochloric acid to calcium carbonate.
   a. Oxygen
   b. Nitrogen
   c. Carbon dioxide
   d. Neon

16. The peripheral nervous system consists of ....
   a. 43 pairs of nerves
   b. 31 pairs of nerves
   c. 12 pairs of nerves
   d. 44 pairs of nerves

17. The .... controls the reflex actions.
   a. spinal cord
   b. cerebellum
   c. cerebrum
   d. brain

18. The part which is responsible for the transfer of nerve messages from different body parts to the brain and vice versa is the ....
   a. cerebellum
   b. vertebral column
   c. medulla oblongata
   d. spinal cord

19. The humerus bone is one of the bones of the ....
   a. lower limbs
   b. upper limbs
   c. axial skeleton
   d. skull

20. The location at which the bones meet together is called ....
   a. tendon
   b. joint
   c. humerus
   d. no correct answer

Ongoing Assessment & Exams

MCQ Governorates Exams (2020 - 2021)

(Answer Guide P. 40)

1 Cairo - El-Zeitoun Educational Directorate

Choose the correct answer:

1. .... is a measuring tool of weight.
   a. Sensitive balance b. Spring scale c. Thermometer d. Two-pan balance
2. If the weight of an object on the earth's surface is 60 Newton, then its weight on the moon's surface is ....
   a. 60 Newton b. 10 Newton c. 6 Newton d. 100 Newton
3. .... joint is from freely movable joints.
   a. Shoulder b. Knee c. Elbow d. Skull
4. .... gas makes limewater turbid.
   a. Nitrogen b. Oxygen c. Carbon dioxide gas d. Ozone

2 Cairo - Al-Sahel Directorate

Choose the correct answer:

1. All the following substances are good conductors of heat except ....
   a. iron and copper b. copper and aluminum
   c. glass and wood d. iron and aluminum
2. If an object's mass on the earth's surface is 30 kgs, then its weight on the earth is ....
   a. 30 Newton b. 300 kg c. 300 Newton d. 50 Newton
3. .... is a gas that is used in distinguishing fire.
   a. CO_2 b. O_2 c. N_2 d. H_2
4. The bony box that contains cavities and protects the brain is from the ....
   a. axial skeleton b. perpendicular skeleton
   c. muscular skeleton d. nervous system

3 Cairo - Al-Basateen & Dar El-Salam Educational Directorate

Choose the correct answer:

1. The device that is used for measuring weight is called ....
   a. one arm scale b. two-arm scale c. digital scale d. spring scale
2. The number of the cranial nerves is .... pairs of nerves.
   a. 31 b. 21 c. 12 d. 5
3. The cerebellum is responsible for ....
   a. thinking process b. the body's balance c. the reflex action d. the sleeping processes

4. The thermometer whose scale starts from 35 to 42 is ....
   a. medical thermometer
   b. laboratory thermometer
   c. alcoholic thermometer
   d. no correct answer

4 Giza - Al-Sheikh Zayed Educational Directorate

Choose the correct answer:

1. The human rib cage consists of .... pairs of ribs.
   a. 10 b. 12 c. 13 d. 11
2. From the materials that are good conductors of heat is ....
   a. plastic b. glass c. iron d. wood
3. Weight is measured by using a .... scale.
   a. spring b. sensitive c. balance d. measuring cylinder
4. The function of the skull is ....
   a. keeping the body balance
   b. controlling the reflex action
   c. protecting the spinal cord
   d. protecting the brain

5 Giza - EL-Agouza Educational Directorate

Choose the correct answer:

1. The fastest metal in conducting heat is ....
   a. copper b. iron c. aluminum d. gold
2. The gravitational force for an object whose mass is 3 kg is ....
   a. 3N b. 300N c. 3000N d. 30N
3. The carbon dioxide is used in the industry of ....
   a. steel b. gunpowder c. fertilizers d. soft drinks
4. The axial skeleton consists of all of the following except ....
   a. the skull
   b. the vertebral column
   c. the limbs bones
   d. the rib cage

6 Giza - Bolaq El-Dakrour Educational Directorate

Choose the correct answer:

1. The joints which allow movement in one direction only are called ....
   a. immovable b. slightly movable c. freely movable d. unlimited
2. The weight (Newton) = the mass (kilogram) X ....
   a. 10 b. 100 c. 1000 d. 6
3. The liquid that is used in the manufacture of thermometers is ....
   a. methyl alcohol b. water c. mercury d. oil
4. The cooking pots are made up of ....
   a. plastic b. aluminum c. wood d. carbon

Ongoing Assessment & Exams

7 Aswan - Aswan Educational Directorate

Choose the correct answer:

1. From the materials that are bad conductors of heat is ....
   a. iron b. copper c. wood d. aluminum
2. Nitrogen is the most important part of ....
   a. proteins b. carbohydrates c. fats d. water
3. The number of cranial nerves is .... pairs of nerves.
   a. 31 b. 21 c. 33 d. 12
4. The device that is used for measuring weight is ....
   a. one-arm scale b. two-arm scale c. digital scale d. spring scale

8 Sharkia - West Zagazig Educational Directorate

Choose the correct answer:

1. .... nearly equals the mass of one paper clip.
   a. Kilogram a. Gram c. Newton d. Ton
2. Nitrogen represents .... of the earth's atmosphere.
   a. 90% b. 21% c. 0.03% d. 78%
3. The bulb of the medical thermometer is filled with ....
   a. water b. oil c. mercury d. alcohol
4. The best metal in conducting heat is ....
   a. copper b. aluminum c. iron d. mercury

9 Menofia - Berket ElSabaa Educational Directorate

Choose the correct answer:

1. An object whose weight is 20 Newton on Earth, its mass is equal to ....
   a. 20 kg b. 10 kg c. 2 kg d. 200 kg
2. The main idea of thermometer is changing the .... of the liquid according to temperature.
   a. mass b. volume c. weight d. color
3. Oxygen reacts with nitrogen in the event of lightning composing compounds known as ....
   a. ozone b. nitrogen c. nitrogen oxide d. potassium hydroxide
4. .... controls reflex action.
   a. Heart b. Spinal cord c. Cerebellum d. Cerebrum

10 Suez - South Educational Directorate

Choose the correct answer:

1. The device that is used for measuring weight is ....
   a. two-arm scale b. digital scale c. spring scale d. gram
2. The liquid that is used in making the medical thermometer is ....
   a. water b. mercury c. alcohol d. copper
4. Nitrogen gas represents .... of the atmosphere.
   a. 21% b. 78% c. 1% d. 56%
5. The cerebellum is responsible for ....
   a. thinking process b. the body's balance c. the reflex action d. heartbeats

11 Port Said - North Educational Directorate

Choose the correct answer:

1. From the measuring units of weight is ....
   a. gram b. liter c. Newton d. kilogram
2. The best metal in conducting heat is ....
   a. aluminum b. copper c. iron d. wood
3. Oxygen gas is present in the atmosphere in the form of molecule, its structure is ....
   a. O b. O_2 c. O_3 d. O_4
4. The number of cranial nerves is .... pairs of nerves.
   a. 31 b. 21 c. 12 d. 33

12 Luxor - Al Qarna Educational Directorate

Choose the correct answer:

1. The weight of a body is measured by .... balance.
   a. spring b. sensitive c. double pans d. all the previous
2. The gas which is used with acetylene in welding metals is .... gas.
   a. oxygen b. nitrogen c. hydrogen d. carbon dioxide
3. .... is a bad conductor of heat.
   a. Copper b. Glass c. Aluminum d. Iron
4. The part which is responsible for keeping the balance of the human body is ....
   a. two cerebral hemispheres b. cerebellum
   c. medulla oblongata d. spinal cord

Combined Model Exams
(Selected from 2019/2020 Governorates Exams)

(Answer Guide P. 4..)

Model 1

1 Complete the following sentences:

1. We can measure the mass of jewels by using .... tool, while we can measure the weight of an object by using .... tool.
2. The bones of .... limbs are connected to shoulder bones, while the bones of .... limbs are connected to pelvic bones.
3. The graduation of medical thermometer starts from ....°C to ....°C.
4. The plant absorbs .... in the photosynthesis process, while the .... gas is produced.
5. The number of cranial nerves equals .... pairs, while the number of spinal nerves equals .... pairs.

2 Choose the correct answer:

1. The liquid which is used in medical thermometer is ....
   (water – alcohol – mercury)
2. The .... gas is used in making soft drinks.
   (oxygen – nitrogen – carbon dioxide)
3. .... controls the reflex actions.
   (Spinal cord – Medulla oblongata – Cerebellum)
4. .... is responsible for maintaining the body balance during the movement.
   (Medulla oblongata – Spinal cord – Cerebellum)
5. .... is used as a catalyst during the preparation of oxygen.
   (Manganese dioxide – Iron – Nitrogen)

3 **A) Put (✓) or (✗) and correct the false ones:**

1. Copper is the best heat conductor. ( )
2. Oxygen gas occupies 0.03% of the atmospheric air components. ( )
3. The skull has immovable joints. ( )

B) If an object's mass = 6 kg on the earth's surface, calculate.

1. Its mass on the moon.

....

2. Its weight on the earth.

....

3. Its weight on the moon.

....

4 **A) Write the scientific term for each of the following:**

1. A gas used by legumes in the formation of proteins. (..........................)
2. A gas consists of three atoms of oxygen. (..........................)
3. The measuring unit of mass which equals the mass of one liter of distilled water at the normal temperature. (..........................)

B) Give a reason for each of the following.

1. Handles of cooking utensils are made of wood or plastic.

....

2. Carbon dioxide gas is collected by upward displacement of air.

....

Model 2

1 Complete the following sentences:

1. There is a constriction in the .... thermometer.
2. The number of cranial nerves in the human body is .... and the number of spinal nerves is ....
3. Weight is measured by ...., while mass is measured by ....
4. In the photosynthesis process, the plant absorbs .... gas and produces .... gas.
5. .... is the degree of hotness or coldness of a body.

2 Choose the correct answer:

1. .... is a good conductor of heat. (Plastic – Copper – Glass)
2. Nitrogen represents .... % of the earth's atmosphere. (21 – 0.03 – 78)
3. Skull joints are .... (immovable – slightly movable – freely movable)
4. The largest part of the brain is ....
(cerebellum – cerebrum – medulla oblongata)
5. Nitrogen forms an important part in ....
(protein – carbohydrate – fats – water)

3 **A) Write the scientific term for each of the following:**

1. Mixture of gases surrounding the earth. (..................)
2. The building unit of the nervous system. (..................)
3. The liquid which is used in thermometers. (..................)
4. The flame that is used in cutting and welding metals. (..................)

B) Mention one function or one use for each of the following.

1. The spinal cord.

....

2. The Celsius thermometer.

....

4 **A) Put (✓) or (✗) and correct the false ones:**

1. Handles of cooking pots are made of plastic. ( )
2. Carbon dioxide molecule consists of one oxygen atom combined with two carbon atoms. ( )
3. Cerebellum contains centers of thinking and memory. ( )

B) If an object's mass is 5 kg on earth, calculate:

1. Its mass on the moon.

....

2. Its weight on the earth.

....

Model 3

1 Complete the following sentences:

1. Mass is measured by ...., whereas weight is measured by ....
2. Oxygen gas is a .... and odorless gas.
3. In the photosynthesis process the plant absorbs .... gas and produces .... gas.
4. .... gas turns the clear limewater turbid due to forming .... which doesn't dissolve in water.
5. The human .... system consists of axial and appendicular skeletons.

2 Choose the correct answer:

1. The best metal in conducting heat is ....
   a. aluminum b. iron c. copper
2. Oxygen gas is collected by displacing ....
   a. air upwards b. water downwards c. water upwards
3. .... controls the reflex action.
   a. Spinal cord b. Cerebellum c. Cerebrum
4. .... is from freely movable joints.
   a. Skull b. Knee c. Shoulder
5. We cannot live without ....
   a. oxygen b. carbon dioxide c. both of them

3 **A) Put (✓) or (✗) and correct the false ones:**

1. Cooking pots and kettles are made up of plastic. ( )
2. Nitrogen gas is called azote which means life gas. ( )
3. The number of spinal nerves is 31 pairs. ( )
4. The skull has immovable joints. ( )

B) Give a reason for the following statements:

1. The medical thermometer has a constriction.

....

2. Rib cage surrounds both the heart and lungs.

....

4 **A) Write the scientific term:**

1. The measuring unit of weight which is almost equal to the mass of 100 grams. (..........................)
2. A gas used in making soft drinks. (..........................)
3. The main control center in the human body. (..........................)

B) Correct the underlined words.

1. The scale of the Celsius thermometer starts from <u>35°C to 42°C</u>.
2. Nitrogen represents <u>21%</u> of the volume of the atmosphere.
3. The temperature of the oxyacetylene flame reaches <u>5300°C</u>.
4. There are <u>joints</u> between the vertebrae of the backbone.

Model 4

1 Complete the following sentences:

1. The scale of the medical thermometer starts from .... °C and ends at .... °C.
2. The neuron consists of two main parts .... and ....
3. The knee joint is considered from .... joints, while the wrist joint is considered from .... joints.
4. The measurement unit of mass is ...., whereas the measurement unit of weight is ....
5. Oxygen gas is prepared in the laboratory from .... in the presence of ....

2 Choose the correct answer:

1. The liquid that is used in making medical thermometer is ....
   (water – alcohol – mercury)
2. The .... gas is used in making soft drinks.
   (oxygen – nitrogen – carbon dioxide)
3. .... controls the reflex actions.
   (Spinal cord – Medulla oblongata – Cerebellum)
4. .... is responsible for maintaining the body balance during the movement.
   (Medulla oblongata – Spinal cord – Cerebellum)
5. .... is used as a catalyst during the preparation of oxygen.
   (Manganese dioxide – Iron – Nitrogen)

3 **A) Write the scientific term for each of the following:**

1. An organ responsible for the reflex actions of the body. (..................)
2. A tool used to measure the temperature of human body. (..................)
3. A flame used in cutting and welding metals. (..................)
4. The measurement unit of mass which is almost equal to the mass of one liter of distilled water. (..................)

B) Give a reason for each of the following:

1. Ozone gas is very important in nature.
....
2. Cerebellum has great importance during the movement of a body.
....

4 **A) What happens when ...?**

1. The percentage of carbon dioxide increases in the atmosphere.
....
2. The knee joint becomes from the freely movable joints.
....

B) Look at the opposite figure, then label it:

1. ....
2. ....
3. ....
4. ....



Model 5

1 Complete the following sentences:

1. The main center of control in your body is .... and it is found inside a bony case called ....
2. Oxygen is prepared from .... in the presence of ....
3. The number of vertebrae of the vertebral column is ....
4. The mass of a body is measured by ....
5. When the distance between an object and the earth's center increases, its weight ....

2 Choose the correct answer:

1. The catalyst that is used in the preparation of oxygen gas in the laboratory is ....
   a. sodium carbonate b. copper oxide
   c. manganese dioxide d. CO_2
2. Newton is equal to the weight of a body, its mass is ....
   a. 10 gm b. 100 gm c. 1000 gm d. 10000 gm
3. Which of the following gases can be prepared by adding dilute hydrochloric acid to calcium carbonate powder?
   a. Nitrogen. b. Oxygen. c. Hydrogen. d. Carbon dioxide.
4. The percentage of oxygen gas in the atmosphere equals ....
   a. 87% b. 12% c. 30% d. 21%
5. The device that is used for measuring weight is ....
   a. two-arm scale b. digital scale c. spring scale d. one-arm scale

3 Put (✓) or (✗) and correct the false ones:

1. Copper is the best heat conductor. ( )
2. Oxygen gas occupies 0.03% of the atmospheric air components. ( )
3. The skull has immovable joints. ( )
4. A white substance is formed when oxygen reacts with a lighted magnesium ribbon. ( )
5. Cartilages prevent friction between the bones of vertebrae. ( )
6. The outer surface of the hemisphere is called the cerebral cortex and it is white matter. ( )

4 A) Join from column (A) with what is suitable in column (B):

(A)	(B)
1. The backbone	a. knee.
2. The rib cage	b. shoulder.
3. Oxygen gas	c. consists of 33 vertebrae.
4. Nitrogen gas	d. hydrogen peroxide is used in its preparation.
5. Slightly movable joint	e. protects the brain.
6. Freely movable joint	f. consists of 12 pairs of ribs.
	g. represents 78% of the volume of atmospheric air.

1. .... 2. .... 3. .... 4. .... 5. .... 6. ....

B) What happens when ...? (Give reasons if it's possible).

1. You touch a plant with sharp thorns.

....

2. Carbon dioxide passes on clear limewater.

....

Final Exams on the First Term 2019/2020

(Answer Guide P. 42)

1 Cairo - Zeitoun Educational Directorate

1 **A) Complete the following sentences:**

1. Weight is measured in .... which equals the weight of an object whose mass is ....
2. Mercury remains liquid between .... which gives a wide range of temperature measurement.
3. .... is rapid combination with oxygen, but .... is slow combination in the presence of moisture.
4. .... gas turns the clear limewater turbid due to the forming of .... which doesn't dissolved in water.

B) An object whose mass on earth is 6 kg. Calculate its weight on both surfaces of the earth and the moon.

....

....

2 **A) Choose the correct answer:**

1. The number of cranial nerves is .... (31 – 21 – 24)
2. Skull's joints are .... (immovable – slightly movable – freely movable)
3. Nitrogen forms an important part in .... (protein – carbohydrate – fats – water)
4. .... is the fastest element in heat conduction. (Iron – Aluminum – Copper)

B) What happens when ...?

1. You suddenly touch a hot object.

....

2. We add yeast to the dough on making bread.

....

3 **A) Write the scientific term for each of the following statements:**

1. It consists of a gray matter in the form of letter (H) surrounded by the white matter. (........................)
2. The axis of the skeleton in the human body. (........................)
3. It is the degree of hotness or coldness of a body. (........................)

B) Give a reason for each of the following:

1. The environment suffers from an increasing in the ratio of carbon dioxide gas in recent years.

   ....

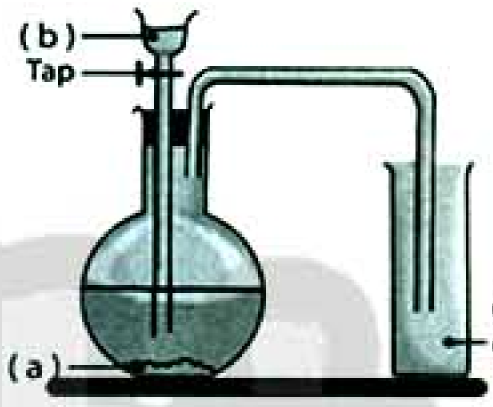
2. There are gaps between railway bars.

   ....

3. Damage of the medulla oblongata causes death.

   ....

4 A) Look at the opposite figure, then answer:



1. Write what each label represents in the figure:

- Substance (a) is ....
- Liquid (b) is ....

2. Mention the uses of carbon dioxide gas:

   1. ....
   2. ....

B) Put (✓) or (✗) and correct the false ones:

1. The nodular bacteria fix oxygen of air in the roots of leguminous plants such as beans and clover. (   )
2. The skeleton of the lower limb consists of humerus bones, 2 forearm bones and bones of the hand. (   )
3. Oxygen gas is produced when hydrogen peroxide dissociates in the presence of carbon dioxide gas. (   )
4. The mass of an object depends on the distance from the center of the planet and the planet where the object exists. (   )

2 Cairo - St. Joseph's School

1 A) Complete the following sentences:

1. .... gas does not help in burning and is abundant in atmosphere.
2. Mercury is used in thermometer because it expands ....
3. The two halves of the cerebral hemispheres are attached together by .... fibers.
4. The human .... system consists of axial and appendicular skeletons.
5. When the distance between an object and the earth's center increases, its weight ....
6. The number of ribs in the rib cage and the number of cranial nerves emerged from the brain is .... pairs.

B) What is meant by?

1. Wood is a heat insulator.

....

2. The human locomotory system.

....

3. Dendrites.

....

2 A) Put (✓) or (✗) and correct the false ones:

1. The mass of manganese dioxide increases after preparation of oxygen. ( )
2. During germination of some seeds, they perform photosynthesis process. ( )
3. Shaft bone is a part of lower limbs. ( )
4. The cerebral cortex is the outer part of cerebellum. ( )
5. Acetylene gas combines with oxygen causing rusting of metals. ( )
6. Nitrogen contributes in the composition of all living tissues. ( )

B) Give a reason for each of the following:

1. Legumes plants do not need fertilizers.

....

2. Carbon dioxide gas is not collected by displacement of water.

....

3. Shoulder joint is a freely movable joint.

....

3 **A) Choose the correct answer:**

1. If the weight of a rocket on the earth's surface is 50 N, then its weight in the space is .... N. (less than 50 – more than 50 – zero)
2. To get liquid carbon dioxide from carbon dioxide gas, we use .... (pressure – cooling – both of them)
3. If an object's mass on the earth is 6000 g, then its weight on the moon= .... (60 N – 60000 N – 10 N)
4. Heartbeat is an involuntary process under control of .... (spinal cord – medulla oblongata – both of them)
5. Painting iron to prevent iron rust, by preventing .... from iron. (oxygen – water vapor – both of them)
6. We cannot live without .... (oxygen – carbon dioxide – both of them)

B) What happens when ...? (Give reasons if it's possible.)

1. One of the peripheral nervous system is damaged.
....
2. You touch a plant with sharp thorns.
....
3. Carbon dioxide passes on clear limewater.
....

4 **A) Write the scientific term for each of the following statements:**

1. The process that increases oxygen percentage in air and decreases carbon dioxide percentage. (....................)
2. The material that is added to dough to produce carbon dioxide. (....................)
3. They are substances that affect sleeping periods and heartbeats. (....................)
4. Natural phenomenon (process) that causes the reaction of oxygen with nitrogen in air forming nitrogen oxide. (....................)
5. The materials as wood, tobacco and gasoline which burn and produce carbon dioxide. (....................)
6. The form of energy that transfers from hot objects to cold objects. (....................)

B) When do we say ...?

1. There is damage in cerebellum.
....
2. Temperature of the earth's surface increases (global warming).
....
3. The objects on the earth have no weight.
....

Ongoing Assessment & Exams

3 Cairo - Al-Khalifa & Al-Moqattam Zone - Virginia Internationl School

1

A) Correct the underlined words:

1. Newton is the amount of matter in an object. (..............)
2. Human rib cage is composed of 31 pairs of ribs. (..............)
3. As the mass of a planet increases, its gravitational force decreases (..............)
4. The part which is responsible for keeping the balance of the human body is spinal cord. (..............)
5. Carbon dioxide gas is collected by downward displacement of water (..............)
6. Medical thermometer is used to measure the temperature of water. (..............)

B) What happens when...?

1. Dilute hydrochloric acid is dropped over calcium carbonate.
....
2. There is no constriction above the mercury bulb in the medical thermometer.
....
3. A wet iron nail is exposed for many days to humid air.
....

2

A) Choose the correct answer:

1. A substance which is a bad conductor of heat is ....
a. air b. iron c. copper
2. Oxygen gas ....
a. doesn't burn and doesn't help in burning
b. burns and helps in burning
c. doesn't burn but helps in burning
3. The melting point of ice is .... °C.
a. 100 b. zero c. 37
4. The joint is the location of meeting of ....
a. two bones b. a muscle with a bone c. two muscles
5. Ozone molecule consists of .... atoms linked together.
a. 3 oxygen b. 3 hydrogen c. 2 oxygen
6. .... nearly equals the mass of one paper clip.
a. Gram b. Kilogram c. Ton

B) Give a reason for the following:

1. Damage of medulla oblongata leads to death.

....

2. Yeast is added to dough during making bread.

....

3. Oxygen is collected by downward displacement of water.

....

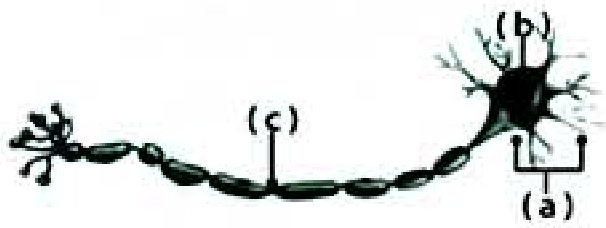
3 **A) Look at the opposite figure, then answer:**

1. This is .... cell.
2. Write the labels:

(a) ....

(b) ....

(c) ....



B) If the weight of a person is 600 Newton on the earth's surface, calculate:

1. His/her mass on the earth.

....

2. His/her weight on the moon.

....

C) Classify each of the following joints according to their types:

1. Skull joints: ....
2. Wrist joints: ....

4 **A) Compare between:**

Points of comparison	Nitrogen gas	Oxygen gas	Carbon dioxide gas
1. Percentage in air	....	....	....
2. Its symbol	....	....	....

B) Mention one use for each of the following:

1. Skull.

....

2. Spinal cord.

....

3. Oxyacetylene flame.

....

4 Giza - Experimental Educational Directorate

1 A) Complete the following sentences:

1. The neuron consists of .... and ....
2. Carbon dioxide is prepared in the laboratory by adding .... to the powder of ....
3. Mass is measured by .... whereas weight is measured by ....
4. The human skeletal system consists of .... and ....

B) What is the importance of ...?

1. The ozone layer.

....

2. Cerebellum.

....

2 A) Write the scientific term for each of the following statements:

1. A chemical substance that increases the speed of the reaction without changing in its quantities and properties. (....................)
2. Materials that don't let heat flow through. (....................)
3. The area where bones meet and allow the movement. (....................)
4. The gas that composes the protein substance that builds up our bodies. (....................)

B) Give a reason for each of the following:

1. Isolating the iron pillars of bridges from air by paints.

....

2. Moving your hand quickly when it suddenly touches a hot surface.

....

3 A) Choose the correct answer:

1. Humerus bone belongs to the bone of the ....
   a. skull b. upper limb c. lower limb
2. The weight of an object on the earth's surface equals 5 Newton, then its mass equals ....
   a. 5 kg b. 0.5 kg c. 50 kg
3. The gas which is used with acetylene in welding metals is ....
   a. nitrogen b. carbon dioxide c. oxygen
4. .... happens when carbon dioxide percentage increases, causing the earth's temperature to increase.
   a. Oxidation b. Global warming c. Burning

B) Compare between: Celsius and medical thermometers

Points of comparison	Celsius thermometer	Medical thermometer
Usage	....	....
Scale range	....	....

4 A) Correct the underlined words:

1. Medulla oblongata control the voluntary movements as walking. (..........................)
2. The number of cranial nerves is 31 pairs of nerves. (..........................)
3. The elbow joint is one of the immovable joints. (..........................)

B) What happens if...?

- You blow in a jar that contains clear limewater.

....

C) Look at the opposite figure, then answer the following questions:

1. This figure represents the structure of ....
2. Its location in the human body is ....
3. Label the figure:

(1) ....

(2) ....



5 Giza - Giza Science Inspectorate

1 A) Choose the correct answer:

1. By increasing the distance between an object and the earth's surface, the weight of this object .... (decreases – increases – is not affected – nothing happens)
2. Newton equals the weight of an object whose mass is .... grams. (0.1 – 10 – 100 – 1000)
3. .... is good conductor of heat. (Wood – Copper – Glass – Air)
4. Carbon dioxide is produced when dilute hydrochloric acid is added to the .... (calcium carbonate – calcium oxide – calcium hydroxide – calcium chloride)
5. Nitrogen represents .... of the earth's atmosphere. (87% – 21% – 0.03% – 78%)
6. The part of the nervous system which is responsible for reflex action is .... (cerebrum – spinal cord – medulla oblongata – cerebellum)
7. The rib cage of man consists of .... pairs of ribs. (10 – 11 – 12 – 21)

B) Correct the underlined words:

1. Weight is the amount of matter in an object.
2. There is a constriction in Celsius thermometer.

C) If an object's mass = 20 Kg on earth's surface. Calculate:

1. Its mass on the moon's surface.
2. Its weight on the earth's surface.
3. Its weight on moon's surface.

2 A) Complete the following sentences:

1. The mass can be measured by .... and the weight can be measured by ....
2. The scale of medical thermometer starts from ....°C to ....°C.
3. Oxygen is produced from .... process and carbon dioxide is produced from .... process.
4. The number of cranial nerves is .... pairs and the number of spinal nerves is .... pairs.

B) What would happen in the following cases?

1. Carbon dioxide gas passes through clear limewater.

....

2. The medical thermometer is placed in a cup of boiled water.

....

3 A) Write the scientific term for each of the following statements:

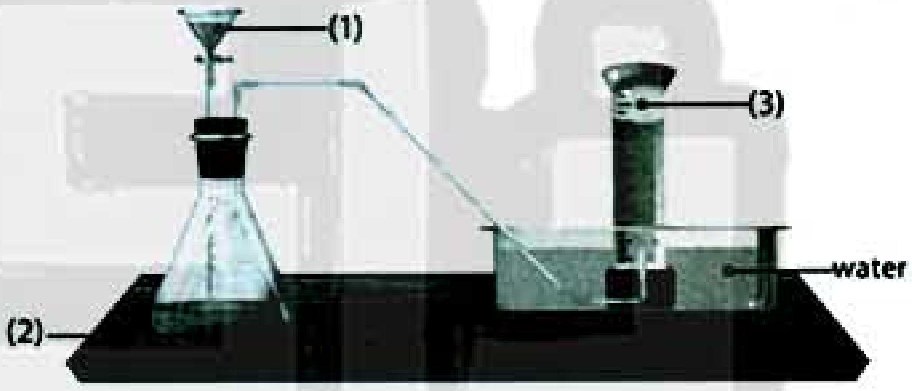
1. The measuring unit of weight. (....................)
2. The gas that is used in making dry ice. (....................)
3. A device used to measure the temperature of the human body. (....................)
4. The building unit of nervous system. (....................)

B) 1. Look at the opposite figure, then answer:

The opposite apparatus is used in the preparation of ....

2. Label the figure:

1. ....
2. ....
3. ....



4 A) Give a reason for each of the following:

1. Mercury is used in thermometer.

....

2. Oxygen is collected by downward displacement of water.

....

3. Carbon dioxide gas is used in extinguishing fires.

....

4. Brain is located inside the skull.

....

B) Mention one use for each of the following:

1. Oxyacetylene flame.

....

2. Cerebellum.

....

6 Giza - Giza Educational Administration

1 Complete the following:

1. The scale of the medical thermometer starts from .... and ends at ....
2. The measurement unit of mass is ...., whereas the measurement unit of weight is ....
3. Oxygen is produced from .... process and carbon dioxide is produced from .... process.
4. The number of cranial nerves is .... and the number of spinal nerves is ....
5. Liquids .... by heating and .... by cooling.
6. Oxygen gas is prepared in laboratory from .... in the presence of ....

2 A) Put (✓) or (✗) and correct the false ones:

1. The spinal cord is responsible for the reflexes. ( )
2. Heat transfers from the cold object to the hot object. ( )
3. Nitrogen gas occupies 78% of the atmospheric air. ( )
4. Aluminum is a bad conductor of heat. ( )
5. CO_2 is heavier than air so it replaces air. ( )
6. The mass of a body changes by changing the place. ( )

B) Give a reason for each of the following:

1. Carbon dioxide gas is used in extinguishing some fires.

....

....

2. Handles of cooking utensils are made of wood or plastic.

....

....

3. Ozone gas is very important in nature.

....

....

3 **A) Write the scientific term for each of the following statements:**

1. The amount of matter in an object. (..................)
2. A bony box that contains cavities for eyes ears and nose. (..................)
3. The building unit of the nervous system. (..................)
4. Location at which bones meet each other. (..................)
5. Automatic body response towards different stimuli. (..................)
6. The degree of hotness or coldness of a body. (..................)

B) If an object's mass = 12 Kg on earth. Calculate:

1. Its mass on the moon.
....
2. Its weight on earth.
....
3. Its weight on the moon.
....

4 **A) Choose the correct answer:**

1. The gray matter in the spinal cord its shape is like the .... letter.
   a. A b. H c. F d. D
2. Nitrogen molecule consists of .... nitrogen atoms.
   a. three b. four c. one d. two
3. The rib cage in man consists of .... pairs of ribs.
   a. 11 b. 10 c. 12 d. 33
4. The best metal in conducting heat is ....
   a. aluminum b. copper c. iron d. gold

B) Mention one importance for:

1. Spring scale.
....
2. Oxyacetylene flame.
....

7 Alexandria - Middle Zone - Science Inspectorate

1 Complete the following sentences:

1. Oxygen is prepared by the decomposition of .... in the presence of ....
2. When the mass of a planet increases, its .... increases and the .... of the object increases.
3. Heat transfers from .... body to .... body.
4. The locomotory system consists of .... system and .... system.
5. Carbon dioxide gas is .... than the air and it is collected by .... displacement of air.
6. The cell body of nerve cell contains .... and ....

2 A) Write the scientific term for each of the following statements:

1. The measuring unit of mass that equals the mass of one liter of distilled water. (....................)
2. The flame that is used in welding metals. (....................)
3. Materials that let heat to flow through. (....................)
4. The main control center of the body. (....................)

B) Mention one importance for each of the following:

1. Medulla oblongata.

....

2. Medical thermometer.

....

3 A) Choose the correct answer:

1. All the following are from the components of the central nervous system except ....
   a. spinal cord b. cerebral hemisphere
   c. cerebrum d. cranial nerves
2. From the immovable joints are .... joint.
   a. wrist b. skull c. hip d. knee
3. When a lighted magnesium ribbon is inserted in a tube containing carbon dioxide gas .... element deposits on the walls of the tube.
   a. magnesium b. magnesium oxide c. carbon d. calcium
4. If the mass of an object on earth is 6 kg, then its mass on the moon equals ....
   a. 1 Kg b. 60 Kg c. 6 N d. 6 Kg
5. Ozone gas consists of .... atom(s).
   a. one b. two c. three d. four
6. Newton equals the weight of a body whose mass is .... gram(s).
   a. one b. 10 c. 100 d. 1000

B) Give a reason for each of the following:

1. Oxygen is collected by downward displacement of water.

....

....

2. Cooking pots are made of aluminum.

....

....

3. Withdrawal of hand quickly when it touches the thorns of a plant.

....

....

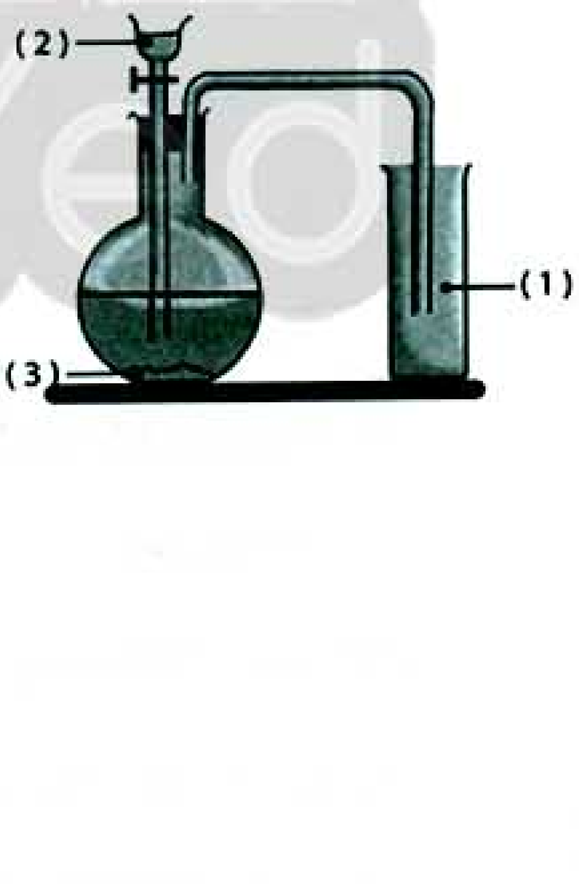
4 **A) Cross the odd word out:**

1. cerebrum - spinal cord - cerebellum - medulla oblongata.
2. oxygen - nitrogen - ammonia - carbon dioxide.
3. kilogram - ton - Newton - gram.

B) Correct the underlined words:

1. Weight is constant doesn't change by changing place.
2. Oxygen is called azote that means lifeless.

C) Study the opposite figure, then answer the questions·



1. Label the figure:
   1. ....
   2. ....
   3. ....
2. This gas is used in .... and ....

8 Qalubia - Qalubia Educational Administration

1 A) Complete the following sentences:

1. .... and .... are good conductors of heat.
2. Mass is constant and it is not affected by ....

B) Write 2 properties only for N_2 gas:

1. ....
2. ....

C) Compare between: Celsius thermometer and medical thermometer.

Points of comparison	Celsius thermometer	Medical thermometer
1. Range of scale	....	....
2. Usage	....	....

2 A) Put (✓) or (✗) and correct the false ones:

1. Axon of the neuron is ended by axon terminals. ( )
2. Cartilages link bones with each other. ( )

B) What happens when? And why?

1. Cerebellum is shocked hardly ....
   Because ....
2. Putting of medical thermometer in boiling water ....
   Because ....

C) Mention one importance of:

1. Medulla oblongata.
2. Constriction of medical thermometer.
3. Ozone layer.
4. Dry ice.

3 ## A) Choose the correct answer:

1. A body of weight 40 Newton on earth, its mass is equal to .... (40 – 400 – 4 – 4000) Kg.
2. Turbid limewater is calcium .... (carbonate – hydroxide – oxide – metal)
3. Gray matter takes the shape of the letter .... (G – U – H – S)
4. Myelin sheath surrounds .... (nerve cell axon – cerebellum – medulla oblongata)

B) If an object's mass on earth= 60 Kg, calculate:

1. Its mass on moon.
2. Its weight on earth.
3. Its weight on the moon.

C) Determine the type of the following joints:

1. Skull joints.
2. Knee joint.

4 ## A) Write the scientific term for each of the following:

1. The unit of an object's weight which equals the mass of 100 gm. (..........................)
2. It is the degree of hotness or coldness of a body. (..........................)
3. The catalyst which is used to prepare O_2 gas in the lab. (..........................)
4. The spontaneous response of the body to different stimuli. (..........................)

B) Give a reason for each of the following:

a. The importance of measuring temperature (2 reasons only).

1. .... 2. ....

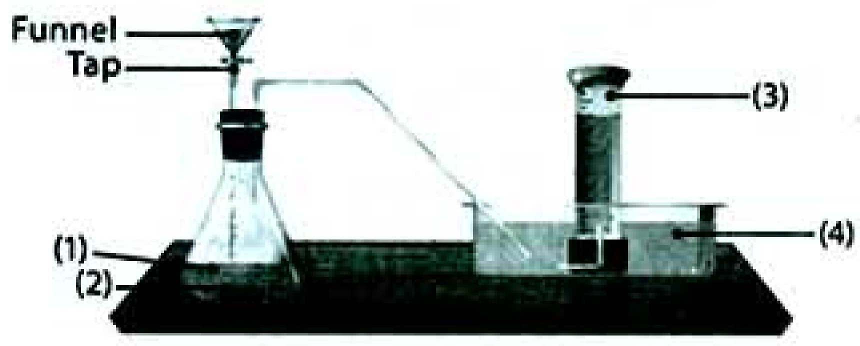
b. The atmosphere is important (2 reasons only).

1. .... 2. ....

C) Label the diagram:

1. .... 2. ....

3. .... 4. ....



9 Gharbia - Department of Language Schools Supervision

1 A) Complete the following sentences:

1. .... is measured in kilogram.
2. Copper conducts heat .... than iron.
3. .... resulted from burning of organic substances.
4. Nitrogen oxides are formed in the atmosphere during ....
5. Myelin sheath surrounds the ....
6. .... is the main control center in your body.

B) If an object's mass = 30 Kg on earth, calculate:

1. Its mass on the moon's surface.

....

2. Its weight on the earth.

....

3. Its weight on the moon.

....

2 A) Choose the correct answer:

1. The device of measuring weight is ....
   a. measuring tape b. balance scale c. spring scale
2. The medical thermometer is used in measuring the temperature of ....
   a. the human body b. liquids c. gases
3. .... gas is used to make soft drinks.
   a. Carbon dioxide b. Oxygen c. Nitrogen
4. .... is located in front of the cerebellum.
   a. Cerebrum b. Cerebellum c. Medulla oblongata
5. The number of spinal nerves is .... pairs of nerves.
   a. 31 b. 21 c. 12
6. The elbow joint is from the ....
   a. immovable joints b. slightly movable joints c. freely movable joints

B) What happens when...?

1. Blowing in limewater for two minutes by using straw.

....

2. You suddenly touch a hot object.

....

3 **A) Write the scientific term for each of the following statements:**

1. It is almost equal to the weight of an object whose mass is 100 grams. (..........)
2. Materials that let heat flow through. (..........)
3. The chemical substance that remains without any change in its quantity and properties during the chemical reaction. (..........)
4. The gas that is used in mechanical ventilation for patients who suffer from breathing difficulties. (..........)
5. The building unit of the nervous system. (..........)
6. The structure which consists of the bones of upper and lower limbs. (..........)

B) Give a reason for each of the following:

1. There is a constriction above the bulb of the medical thermometer.

....

2. It is important not to take sleeping pills without the doctor's prescription.

....

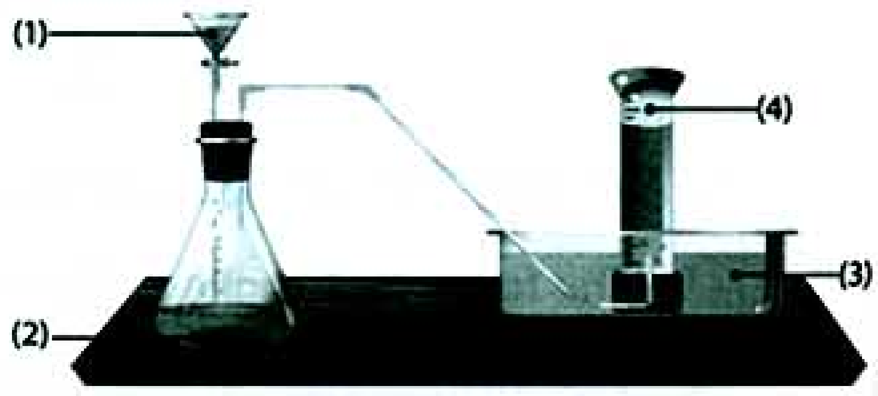
4 **A) Put (✓) or (✗) and correct the false ones:**

1. Aluminum is a bad conductor of heat. ( )
2. Plastic and wood are used to make handles of cooking pots. ( )
3. Carbon dioxide gas is prepared from hydrogen peroxide which dissociates in the presence of manganese dioxide. ( )
4. Legumes such as clover benefit from the nitrogen in air. ( )
5. Cerebellum lies at the back area of the brain below the two hemispheres. ( )
6. The rib cage consists of 33 pairs of ribs. ( )

B) Look at the opposite figure, then answer the questions:

1. This apparatus is used for the preparation of ....
2. Write what each label represents on the figure:

1. ....
2. ....
3. ....
4. ....



10 Kafr Al-Sheikh - Science Inspectorate

1 A) Choose the correct answer:

1. Mass is measured in .... (Newton – gram – meter)
2. (Carbon dioxide – Oxygen – Nitrogen) .... represents 78% of the earth's atmosphere.
3. (Cerebellum – Medulla oblongata – Spinal cord) .... maintains the balance of the body during movement.
4. The backbone consists of .... (35 – 33 – 31) vertebrae with cartilages between them.

B) Look at the opposite figure:



1. What is the name of this device?

....

....

2. What is the measuring unit indicated left to the pointer?

....

....

2 A) Choose from column (B) what suits in column (A):

(A)	(B)
1. Oxygen doesn't burn	a) indicates the presence of carbon dioxide.
2. Turbidity of limewater	b) but it helps in burning.
3. Ankle in foot	c) are the main source of oxygen in the air.
4. Green plants	d) is a freely movable joint.

1. .... 2. .... 3. .... 4. ....

B) Write the scientific term for each of the following statements:

1. The force that makes objects fall down towards the earth. (....................)
2. The form of energy that transfers from a higher temperature object to the a lower one. (....................)

3 A) Give a reason for each of the following:

1. Heavy blankets and wool clothes are used in winter to cover our bodies.

....

....

2. There is a constriction above the bulb of the medical thermometer.

....

....

B) Correct the underlined words:

1. Sensitive two arm balance is used to measure the mass of fruits.
2. Cerebrum is responsible for the reflex action.
3. The medical thermometer scale starts from zero to 100 degrees.
4. Nitrogen is emitted as a result of combustion of organic materials.

4 A) Put (✓) or (✗) and correct the false ones:

1. Plastic and paper are good conductors of heat. ( )
2. Mercury is preferred in making thermometers. ( )
3. Iron becomes heavier in mass when its surface rust. ( )
4. The mass of an object in space is greater than its mass on the earth. ( )

B) Complete the following statements:

1. .... conducts heat faster than aluminum and iron.
2. .... adjusts the temperature of the earth's surface.

11 Beheira - Official Schools Administration

1 A) Complete the following sentences:

1. The weight of an object can be measured by .... scale, while .... is used in measuring the temperature of the boiled water.
2. .... gas is converted into dry ice that is used in ....
3. .... is used to prepare oxygen gas and it is called catalyst.
4. .... gas is called azote.
5. The number of spinal nerves is .... pairs of nerves.
6. If the mass of an object on the moon's surface equals 10 kg, then its mass on the earth's surface equals .... Kg.

B) An object has a mass of 6 kg, calculate the weight of the object:

1. On the surface of the earth.

....

2. On the surface of the moon.

....

2 A) Choose the correct answer:

1. A fatty layer covers the ....
   a. axon b. skull c. the spinal cord d. lung
2. .... nearly equals the mass of one paper clip.
   a. Gram b. Kilogram c. Newton d. Meter
3. The gas which turns limewater turbid is .... gas.
   a. oxygen b. nitrogen c. carbon dioxide d. ozone
4. Copper conducts heat .... aluminum.
   a. faster than b. slower than
   c. similar d. no correct answer
5. Knee joints are .... joints.
   a. immovable b. freely movable c. slightly movable d. constant

B) Give a reason for each of the following:

1. There is a constriction in the medical thermometer.

....

2. Ozone gas is very important in nature.

....

3 **A) Write the scientific term for each of the following statements:**

1. The materials that allow heat to flow through. (..............................)
2. The gas whose molecule is composed of three oxygen atoms. (..............................)
3. The flame that is used in cutting and welding metals. (..............................)
4. The basic structural unit of the nervous system. (..............................)

B) Mention one use of the following:

1. Rib cage.

....

....

2. Skull.

....

....

4 **A) Correct the underlined words:**

1. Air is a good conductor of heat.
2. Medulla oblongata maintains the balance of the body during the movement.
3. Oxygen gas is formed in the atmosphere during lightning.
4. The centers of thinking and memory exist in the spinal cord.

B) What will happen if...?

1. We put a burning ribbon of magnesium in a cylinder filled with CO_2 .

....

....

2. There is no oxygen in the atmosphere.

....

....

AL ADWAA

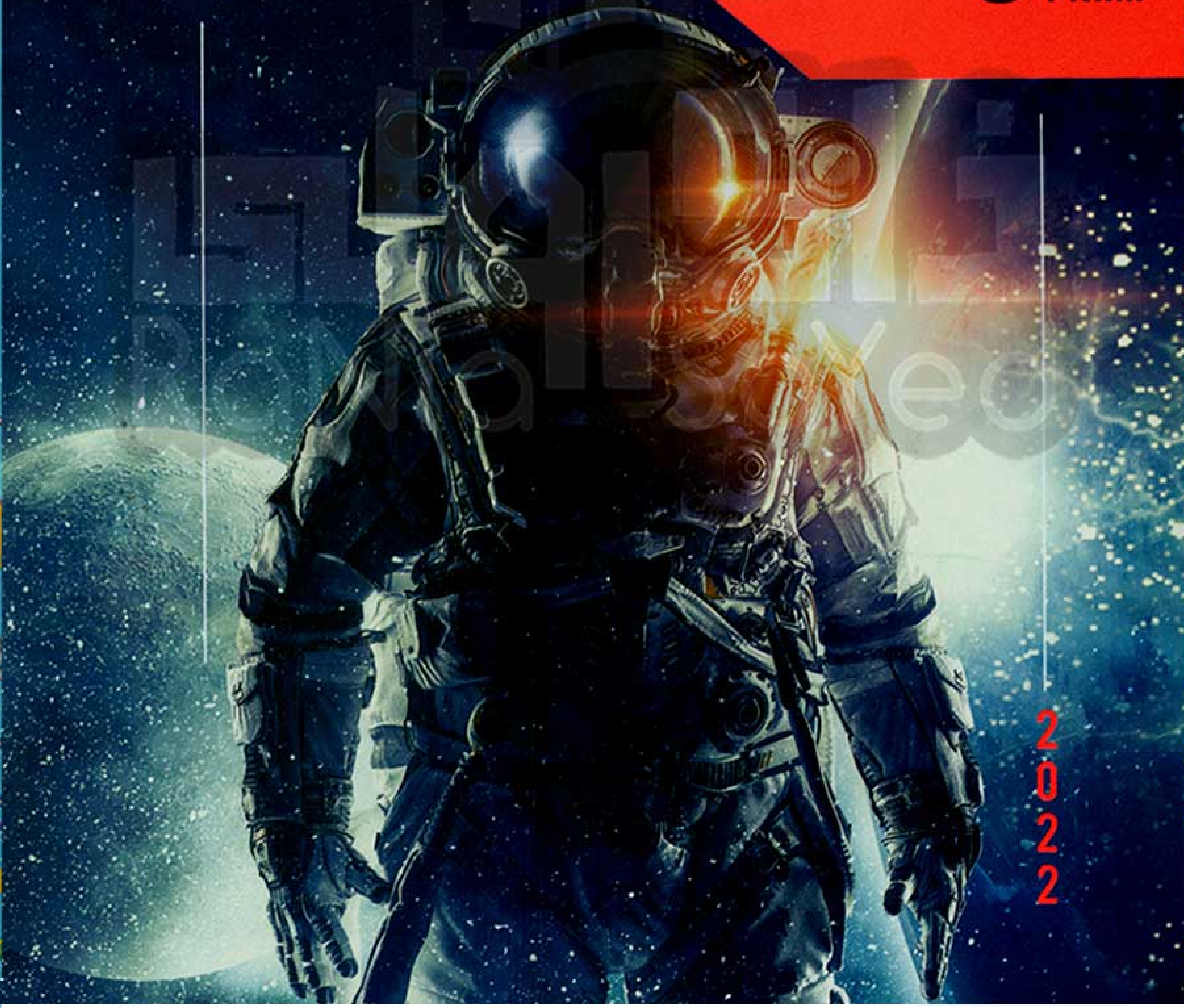
Gem

SCIENCE

FIRST TERM

6th PRIM.

Model Answers



2022

Model Answers

First: The Main Book

Unit 1 Force and Motion

Lesson 1 Mass and Weight

Checkpoint (1) P. 13

1. mass
2. A school bag

Checkpoint (2) P. 15

1. 5
2. 845000
3. 0.25
4. 2.5

Checkpoint (3) P. 16

1. fixed - place -physical.
2. sensitive - digital.

Benchmark P. 19

1
1. Mass
2. Gram
3. Kilogram
4. Balance scale

2
1. changing place
2. increases
3. one-arm scale - two-arm scale
4. kg or gm

3
1. (✗) 2. (✓) 3. (✗) 4. (✓)

4 Because the mass of an object is a fixed value that doesn't change by changing the place.

5
1. equal to
2. mass

Checkpoint (4) P. 27

1. mass on the earth = $\frac{600}{10}$ = 60 kg

   mass on the moon = 60 kg

   weight on the moon = $\frac{600}{6}$ = 100 N
2. Weight on mars = 233.3 N
3. The weight decreases as the distance between the object and the center of the earth increases.

School Book Exercises on Lesson 1 P. 30

1
1. gram - kilogram - Newton
2. balance scale - spring scale
3. place - physical change
4. mass of object - the planet where the object exists.

2
1. mass
2. weight
3. kilogram
4. Newton

3 The weight on the earth = mass (kg) × 10

= 6 × 10

= 60 N

The weight on the moon = $\frac{\text{mass} \times 10}{6}$

= $\frac{60}{6}$ = 10 N

4 Mass of the beaker = 119.76 gm

- Mass of the beaker + the liquid = 186.73 gm
- Mass of the liquid = mass of the liquid and mass of the beaker – mass of the beaker.

  =186.73 – 119.76 = 66.97 g

The weight of the liquid = mass × 10

= 66.97 × 10

= 669.7 N

5
1. the amount of matter in an object
2. the force with which the body is attracted to the earth
3. gram - kilogram
4. Newton
5. balance scale, sensitive scale, one-arm scale with a pointer
6. spring scale
7. has no direction
8. towards the center of the planet
9. constant
10. variable

6
1. d
2. c
3. a
4. b

Model Answers

Al-Adwaa Exercises on Lesson 1
P. 32

Mass

1 1. (b) 2. (a) 3. (b)
4. (c) 5. (d) 6. (a)
7. (b)

2
1. Mass
2. Kilogram
3. one-arm scale - two-arm scale
4. small masses
5. equal to
6. changing place
7. increases
8. kg, gm

3
1. (✗) mass
2. (✗) balance scale
3. (✗) kg
4. (✗) gram
5. (✓)
6. (✗) mass
7. (✗) 1000
8. (✓)

4
1. Mass
2. Kg - g
3. Gram
4. Balance scale
5. Sensitive scale
6. Balance scale
7. Kilogram

5
1. mass
2. gm
3. balance scale
4. kilogram
5. mass
6. equal to
7. gram - kilogram

6
1. Because the mass is a constant value that does not change with the change in the place.
2. To avoid vibrations.

7
1. It is used for measuring large masses.
2. It measures the mass of small objects.
3. It measures the mass of small objects.

8 It is the amount of matter in an object.

9 The mass of the liquid = M2 – M1
= 370-175 = 195 gm.
The mass of the solid state of this liquid = 195 grams because the mass is a constant value that doesn't change by changing the physical state.

Weight

1 1. (a) 2. (c) 3. (a)
4. (d) 5. (b) 6. (c)
7. (b) 8. (a) 9. (a)
10. (c) 11. (b) 12. (c)
13. (d) 14. (a) 15. (d)
16. (d) 17. (a)

2
1. weight – Newton
2. the center of the Earth
3. Newton
4. balance – spring
5. six
6. $\frac{1}{6}$
7. constant – variable
8. gravity
9. mass of object – planet where the object exists
10. mass
11. increases
12. decreases – increases
13. 20 kg
14. 150 N
15. increases

Model Answers

3
1. (✓)
2. (✓)
3. (✗) spring scale
4. (✗) $\frac{1}{6}$
5. (✗) center
6. (✓)
7. (✗) increases
8. (✗) increases
9. (✗) decreases
10. (✗) 20 N
11. (✗) 100 N

4
1. Weight
2. Spring scale
3. Newton
4. Weight
5. Mass

5
1. weight
2. weight
3. Newton
4. spring scale
5. center
6. gravity
7. weight – weightless
8. weight
9. decreasing
10. directly
11. decreases, decreases
12. 10 N

6
1. Due to gravitational force.
2. Because the weight depends on gravity, which is 6 times greater on Earth than on the Moon.
3. Because the mass of the moon is less than the mass of the earth.
4. Because weight is directly proportional to mass.
5. Because it moves downwards towards the force of gravity pulling objects.
6. Because the gravitational force changes from a planet to another.
7. Because the gravity decreases by moving away from the center of the earth.

7
1. The weight of the object will increase.
2. The weight of this object decreases to half.
3. All bodies will move away from the earth and will be lost in space as they become weightless.
4. The weight of this object increases.
5. The person's weight will decrease as the balloon rises up away from the earth's surface.
6. Its weight will decrease and the mass doesn't change.

8
1. (c)
2. (e)
3. (b)
4. (f)
5. (d)
6. (a)

9
1. It attracts all living organisms to the earth's surface which makes them move easily on the earth, it also attracts the moon which reflects sunlight to the earth during night.
2. It is the measuring tool of weight.

10
1. It is the force with which the body is attracted to the earth.
2. It is the measuring unit of weight and it is almost equal to the weight of an object on the earth's surface whose mass is 100 grams.

Model Answers

11

Mass	Weight
1. The amount of matter in an object.	1. The force by which a body is attracted to the earth.
2. Gram - kilogram -Ton	2. Newton
3. Balance scale - Sensitive two-arm scale. - One-arm digital scale. - One-arm scale with a pointer	3. Spring scale
4. No direction.	4. Towards the planet center.
5. Constant (it does not change with the change in the place.)	5. Variable (it changes from a planet to another.)

12

Celestial body	Your mass here (kg)	Gravitational force	Your weight here (N)
The earth	60	10	600
The moon	60	1.6	96
The sun	60	274	16440
Jupiter	60	25.9	1554

1. The Sun 2. The Moon

13 1. Mass of the object.
2. The planet (place) where the object exists.
3. The distance between objects and the center of the planet.

14 The balance scale is used in measuring the mass, while the spring scale is used in measuring the weight of an object.

15



16 1. a. 30 kg b. 300 N c. 50 N

2. a. Mass on the Earth = weight on earth/ 10 = 3 kg
   b. Mass on the moon = 3 kg, because mass is constant.
   c. Weight on the moon = $\frac{\text{weight on earth}}{6}$
   $= \frac{30}{6} = 5$ N

3. 30 N 4. 20 kg 5.100 N

6. a. Mass = $\frac{\text{weight on earth}}{10}$
   $= \frac{300}{10} = 30$ kg.
   b. Weight on the moon = weight on earth $\frac{300}{6}$
   = 50 N.

7. a. Weight on the earth = weight on the moon × 6
   = 100 × 6 = 600 N
   b. Mass on the earth = $\frac{\text{weight on the earth}}{10}$
   $= \frac{600}{10} = 60$ kg
   c. Mass on the moon = 60 kg, because mass is constant.

8. 5 kg

9. 1. The mass of a piece of rock = total mass of standard masses = 300 grams
   2. The weight of a piece of rock = 3 N
   3. Mass doesn't change but weight changes.

10. The reading of scale = 7.5 kg
    No, the reading will not change according to the location.

TIMSS Like Questions on Lesson 1

P. 43

1 A = 40 , B = 10 , C = 20 , D = 30

B - C - D - A

2

Object	Mass	Weight
Brick	2 kg	20 N
Pile of books	2.5 kg	25 N
Paper clips	1 kg	10 N
Bag of cement	40 kg	400 N

3 a. The digital balance.
b. The amount of matter in the paper clips = 10 gm
c. 10 gm

4 a. spring scale.
b. To estimate the weight of the object.
c. Newton.

5 Refers to page number 16.

Model Answers

Unit 2 Thermal Energy

1 Heat Conduction

Checkpoint (1) P. 49

1. Heat conductors 2. Heat insulators

Checkpoint (2) P. 50

- Copper - Aluminum - Iron

Checkpoint (3) P. 51

1. (a) heat insulators. 2. (b) heat conductors.

Checkpoint (4) P. 52

1. (d).
2. (b).

Benchmark P. 53

1 1. Heat insulators 2. Thermometer
3. Heat energy 4. Temperature

2 The heat of hot glass transfers to your hand, so the temperature of your hand increases.

3

Good conductors of heat	Heat Insulators
They are materials that allow heat to flow through.	They are materials that don't allow heat to flow through.

4 1. thermometers 2. plastic or wood.
3. different.

5 1. Because aluminum is a good conductor of heat that allows heat to flow through but plastic is a bad conductor of heat that doesn't allow heat to flow through.
2. To prevent the leakage of heat as air is a bad conductor of heat.

School Book Exercises on Lesson 1 P. 56

1 1. good 2. copper
3. copper - iron
4. kettles - cooking pot - iron
5. wood - plastic - glass
6. handles of cooking pots - handles of iron - handles of kettles

2 1. (✗) metals 2. (✗) bad
3. (✗) aluminum 4. (✗) wood or plastic
5. (✗) wood

3 1. Good conductor of heat
2. Heat insulators

4

Heat conductors	Heat insulators
1. They are the materials that allow heat to flow through.	1. They are the materials that do not allow heat to flow through.
2. Metals (iron, copper, aluminum and stainless steel).	2. Wood, plastic.
3. Making of cooking pots and kettles.	3. Making of handles of cooking pots and kettles.

Al-Adwaa Exercises on Lesson 1 P. 57

Heat energy and its importance

1 1. (b) 2. (b) 3. (a) 4. (b) 5. (a) 6. (b)

2 1. energy
2. higher temperature - lower temperature
3. Temperature
4. thermometer.
5. food industry - glass industry
6. cooking - drying washed clothes

3 1. (✗) from hot to cold
2. (✗) temperature
3. (✗) thermometer
4. (✗) measuring temperature

Model Answers

4 1. Heat 2. Heat
3. Temperature 4. Thermometer

5 1. higher - lower 2. Temperature
3. thermometer 4. hand to ice

6 1. Because it is used at home for warming houses, cooking, drying clothes and water heating.
2. Because they are used in many industries such as food, paper, glass and textile industries.
3. Because heat transfers from the cup of tea to the hand, so the hand's temperature increases.
4. Because heat transfers from the hand to the cup, so the hand's temperature decreases.

7 1. The hand's temperature will increase.
2. The hand's temperature will decrease.
3. The heat energy will transfer from the hot object to the cold object.
4. The heat energy will not transfer between the two objects.

8 1. It is a form of energy that transfers from an object of higher temperature to an object of lower temperature.
2. It is the degree of hotness or coldness of an object.

9 1. In our daily life in cooking and in industry in making and processing food, glass and paper.
2. It is used for measuring temperature.

10 1. (c) 2. (b) 3. (a)

Heat conductors and Heat insulators

1 1. (c) 2. (a) 3. (c) 4. (c) 5. (a)
6. (a) 7. (b) 8. (a) 9. (b)

2 1. heat conductors 2. heat insulators
3. faster 4. copper – iron
5. conductors – insulators
6. good 7. plastic - wood – glass
8. copper.

3 1. (✓) 2. (✗) heat insulators
3. (✓)
4. (✗) copper conducts heat faster than aluminum
5. (✓) 6. (✗) at different rates
7. (✗) Iron and copper

4 1. Heat conductors 2. Heat insulators
3. Heat conductors 4. Heat insulators
5. Copper

5 1. bad 2. Aluminum
3. conductor 4. different rates
5. iron 6. copper

6 1. Because it allows heat to flow through.
2. Because they do not allow heat to flow through

7 We will feel hot.

8 1. They are the materials that allow heat to flow through.
2. They are the materials that do not allow heat to flow through.

9 1. The odd word : wood
The scientific term: Heat conductors
2. The odd word: aluminum
The scientific term: Heat insulators

10 1. Refers to the activity page 48 .
2. Refers to the activity page 50 .

11 Glass rod, because it is a bad conductor of heat that does not allow heat to flow through.

Heat conductors and heat insulators (uses and life applications)

1 1. (d) 2. (b) 3. (a) 4. (a)
5. (c) 6. (b) 7. (b)

2 1. air 2. heat
3. gaps 4. aluminum – plastic

3 1. (✓)
2. (✗) stainless steel
3. (✗) heat insulator 4. (✗) prevent
5. (✓)

Model Answers

4 1. Heat conductors
2. Heat insulators
3. Air
4. Woolen

5 1. plastic
2. aluminum or stainless steel
3. plastic

6 1. Because they are heat conductors.
2. Because it is a bad conductor of heat.
3. Because it is a good conductor of heat.
4. Because they are used in making cooking pots, pans and kettles.
5. Because they are used in making handles of cooking pots, pans, iron and kettles.
6. To keep bodies warm as wool is a bad conductor of heat.
7. Because air is a bad conductor of heat that prevents leakage of heat.
8. To avoid train accidents as iron is a good conductor of heat which expands and twists by heat.

7 1. Man will not be able to handle all the substances exposed to high temperature.
2. We can't handle cooking pots during cooking.
3. Train accidents will occur.

8 1. They are used in making cooking pots and kettles.
2. They are used in making the handles of cooking pots and kettles.
3. They are used in making cooking pots and kettles.
4. They are used in making the handles of cooking pots and kettles.
5. They are used in winter to keep bodies warm.
6. To ease its handling during cooking.

9 1. (b) 2. (a) 3. (c)

10

Points of comparison	Aluminum	Wood
The ability to conduct heat	Good conductor of heat	Bad conductor of heat
Uses	Making the cooking utensils	Making the handles of the cooking utensils

TIMSS Like Questions on Lesson 1

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1 To avoid train accidents.

2 (c) (✓) The button on the spoon.
Because the spoon is a metal which is a good conductor of heat.

3 a. False b. True c. True d. True

4 The hand which touches the aluminum spoon, because spoon allows heat to flow through.

5 Search the internet for the warm blooded animals.

2 Measuring Temperature

Checkpoint (1) P. 67

A) • Thermometer
B) 1. No, because the sense of touching tells us if the body is hot or cold only.
2. a. It measures the human bodies' temperature
b. It measures weather temperature.

Checkpoint (2) P. 73

1. medical, Celsius 2. 35 - 42 , 0 -100

Benchmark P. 75

1 1. volume, temperature
2. medical (clinical)
3. 35°C – 42°C
4. Celsius thermometer - medical thermometer
5. temperature of liquids
6. 0°C, 100°C

2 To prevent mercury from going back to the bulb quickly in order to read the temperature easily.

3 1. mercury 2. digital thermometer
3. Celsius thermometer

4 Celsius degree (°C).

5 1. (✗) 2. (✓)

School Book Exercises on Lesson 2

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1 1. 35°C - 42°C 2. medical
3. medical - Celsius
4. measuring the temperature of liquid - measuring the temperature of human body.
5. a device used to measure the temperature.
6. Zero °C - 100 °C

2 1. (✗) liquid 2. (✗) 35° C - 42° C
3. (✗) human body 4. (✗) medical
5. (✗) mercury

3 1. Celsius thermometer
2. medical thermometer 3. mercury

4

Points of comparison	The medical thermometer	The Celsius thermometer
Range of scale	• From 35°C to 42°C.	• From 0°C to 100°C
Constriction	• Present	• Absent
Used liquid	• Mercury	• Mercury
Usage	• It is used to measure the temperature of the human body.	• It is used to measure the temperature of liquids.
Structure	a. A transparent thick glass tube. b. A capillary tube closed from one of its ends. c. A mercury bulb that is filled with mercury and connected to the other end of the capillary tube.	

5 Refers from p. 69 to p. 72

Al-Adwaa Exercises on Lesson 2

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Medical thermometer

1 1. (b) 2. (b) 3. (b) 4. (c)
5. (c) 6. (d) 7. (a) 8. (d)
9. (c) 10. (c) 11. (d)

2 1. thermometer 2. Celsius – medical
3. the device used to measure the temperature
4. medical thermometer
5. volume – temperature
6. constriction 7. Constriction
8. 10. 9. 35°C - 42°C
10. shake 11. sterilize

3 1. (✓) 2. (✗) thermometer
3. (✓) 4. (✗) 35˚C - 42˚C
5. (✗) 37˚C 6. (✓)
7. (✓) 8. (✗) using ethyl alcohol
9. (✓)

4 1. Thermometer 2. Medical thermometer
3. Constriction 4. Ethyl alcohol
5. Mercury bulb 6. Medical thermometer

5 1. volume 2. 35°C to 42°C
3. medical 4. constriction
5. mercury 6. ethyl alcohol
7. 37˚C 8. sterilize

6 1. Because it helps us know our bodies temperature, to check our health condition, and the weather temperature, and it is important to some food industries that require certain temperature.
2. Because the sense of touching helps us to find out if the body is hot or cold but it is not an accurate method for measuring temperature.
3. To prevent mercury from going back quickly to the bulb.

Model Answers

4. Because it is the maximum temperature that the body reaches.
5. To kill microbes.
6. To force the mercury go back to the bulb.
7. Because mercury is toxic.
8. In order not to be broken as mercury is toxic.

7
1. Mercury goes back quickly, so it is hard to record a correct reading.
2. Microbes can transfer easily.
3. Mercury will not go back to the bulb and will not give accurate temperature.

8
1. It is the device used to measure the temperature.
2. It is the device used to measure the temperature of the human body.

9
1. Measuring temperature.
2. Measuring temperature of the human body.
3. Preventing mercury from going back quickly to the bulb to record accurate reading.
4. Sterilizing the thermometer for killing microbes.

10
1. medical thermometer.
2. 1- mercury bulb. 2- constriction. 3- capillary tube. 4- transparent thick glass tube.
3. measuring the temperature of the human body.
4. preventing mercury from going back to its bulb.

11 The idea of making thermometer is the change in the volume of liquids as the temperature changes.

Celsius Thermometer

1
1. (c) 2. (c) 3. (b) 4. (c)
5. (d) 6. (a) 7. (c) 8. (c)
9. (b) 10. (c) 11. (b)

2
1. Celsius 2. 0°C - 100°C
3. Celsius 4. Mercury
5. 0° C - 100° C 6. Expands
7. Stick 8. Liquid
9. liquids - human body

3
1. (✗) medical thermometer
2. (✗) 0°C to 100°C 3. (✗) good
4. (✓) 5. (✗) mercury

4
1. Mercury bulb 2. Celsius thermometer
3. Celsius thermometer
4. Zero°C 5. 100°C

5
1. Celsius 2. 0°C 3. mercury
4. good 5. expands 6. boiling

6
1. Because the water boiling degree is 100°C which is larger than the scale of the medical thermometer.
2. Because the freezing point of water is zero which is less than the scale of the medical thermometer
3. Because it can be seen easily through the capillary tube, it is a good conductor of heat, it expands regularly and it does not stick to the wall of the capillary tube.
4. Because it expands regularly and it remains liquid from - 39°C to 357°C so, it gives a wide range for measuring temperature.

7
1. It expands regularly, and stays in the liquid state till 357°C.
2. It cannot measure the temperature.
3. Mercury will expand.

8 It is the device used to measure the temperature of liquids.

9
1. Measuring temperature of liquids.
2. It is a liquid metal that can be seen easily, a good conductor of heat, that expands by heat and contracts by cooling in order to measure temperature.

10
1. Celsius thermometer.
2. 1- mercury bulb. 2- capillary tube. 3- transparent thick glass tube.
3. measuring the temperature of liquids.

11

Medical thermometer	Celsius thermometer
1. It measures the temperature of the human body.	1. It measures the temperature of liquids.
2. Structure: - Capillary tube. - Transparent thick glass tube. - Mercury bulb. - It has a constriction.	2. Structure: - Capillary tube. - Transparent thick glass tube. - Mercury bulb. - It has no constriction.
3. Mercury.	3. Mercury.
4. 35°C - 42°C.	4. 0°C - 100°C.

12 1. 1. (c) 2. (b) 3. (a) 4. (d) 5. (e)
2. 1. (c) 2. (d) 3. (a) 4. (b) 5. (e)

13 1. The Celsius thermometer and the medical thermometer.
2. The medical thermometer is used for measuring the temperature of the human body and has a constriction, while the Celsius thermometer is used to measure the temperature of liquids and has no constriction.

TIMSS Like Questions on Lesson 2

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1 a- (i) Celsius thermometer
(ii) It measures the temperature of liquid
b- A- 50 degrees Celsius
B- 30 degrees Celsius

2 a. 0°C - 100°C
b. The clinical thermometer contains a constriction to prevent mercury from going back quickly to the mercury bulb.

3 a. Noha and Mohamed.
b. Doaa and Mariam.

4 Refers to page 71.

Unit 3 The Atmosphere

Lesson 1 Oxygen

Checkpoint P. 94

1. gases , the earth
2. gravity
3. 21%
4. Protects the earth from harmful radiations, adjusts the temperature of the earth's surface.

Benchmark P. 98

1 1. oxygen, carbon dioxide.
2. respiration, combustion.
3. hydrogen peroxide-manganese dioxide.
4. manganese dioxide

2 b) oxygen and water.

3 1. Because green plants produce oxygen by photosynthesis process to compensate its loss during respiration and burning processes.
2. Because:
1) It protects the earth from harmful radiations which come from outer space.
2) It adjusts the temperature of the earth's surface.

4 1. The harmful radiations will reach the Earth.
2. It affects the respiration process of living organisms.

5 1. The atmosphere:
1) It protects the earth from harmful radiations which come from the outer space.
2) It adjusts the temperature of the earth's surface.
2. The air pollutants:
They help in the condensation of water vapor and falling of rains or snow.

Model Answers

School Book Exercises on Lesson 1
P. 106

1
1. (✓)
2. (✗) manganese dioxide
3. (✗) increases
4. (✗) 3 atoms
5. (✓)
6. (✓)

2 The burning process can't be controlled.

3
1. Because it's compensated by green plants during photosynthesis process.
2. Because oxygen gas scarcely dissolves in water.
3. Because it protects the earth from the harmful radiations which come from the outer space.

4 The ozone molecule is formed by the combination of three oxygen atoms and it forms a layer in the atmosphere called the ozone layer. To protect the earth from harmful rays coming from the sun.

5
1. Oxygen (O_2) is colorless, tasteless and odorless.
2. Oxygen is scarcely (slightly) soluble in water.
3. Oxygen does not burn, but it helps in burning.
4. Oxygen is heavier than air, so it replaces air.
5. Oxygen combines directly with most elements forming oxides.

Al-Adwaa Exercises on Lesson 1
P. 108

The Earth's Atmosphere
Oxygen gas (structure - sources and preparation)

1
1. (b)
2. (d)
3. (b)
4. (a)
5. (b)
6. (a)
7. (d)
8. (c)
9. (b)
10. (b)
11. (b)
12. (c)
13. (c)

2
1. the mixture of gases surrounding the earth and attracted to it by the effect of gravitational force.
2. Ultraviolet
3. green plants – photosynthesis
4. green plants on the earth
5. 21%
6. hydrogen peroxide
7. gravitational force
8. condensation - rain - snow
9. respiration – burning
10. water
11. Catalyst
12. 78% - oxygen
13. carbon dioxide - oxygen

3
1. (✓)
2. (✗) nitrogen.
3. (✗) manganese dioxide
4. (✗) oxygen and water
5. (✗) absorb carbon dioxide and produce oxygen.

4
1. Atmosphere
2. Oxygen
3. Dust particles
4. Oxygen gas
5. Oxygen
6. Hydrogen peroxide
7. Manganese dioxide
8. Catalyst
9. Downward displacement of water

5
1. oxygen
2. two
3. nitrogen
4. manganese dioxide
5. hydrogen peroxide
6. manganese dioxide
7. oxygen
8. water

6
1. Because it protects the earth by absorbing the harmful ultraviolet rays and works on making temperature moderate on its surface.
2. Because it is compensated by green plants during photosynthesis process.
3. To compensate the consumed oxygen gas during respiration and burning by photosynthesis process.
4. Because it acts as a catalyst that helps in speeding up the reaction, but not taking part in it.
5. Because oxygen scarcely dissolves in water.

7
1. Temperature will not be moderate, and the earth will not be protected from ultraviolet rays.
2. Percentage of oxygen will decrease.
3. There will be no life on the earth.
4. There will be a difficulty in respiration of living organisms.
5. Burning process cannot be controlled.

6. Hydrogen peroxide will decompose into water and oxygen.
7. The chemical reaction will be slow.

8

Oxygen	Nitrogen	Carbon dioxide
21%	78%	0.03%

9 It is a chemical substance used in chemical reactions to speed up the rate of the reaction, without any change in its quantity or its properties.

10 It speeds up the rate of the reaction.

11 It acts as a catalyst to speed up the rate of the reaction for dissociation of hydrogen peroxide into oxygen and water.

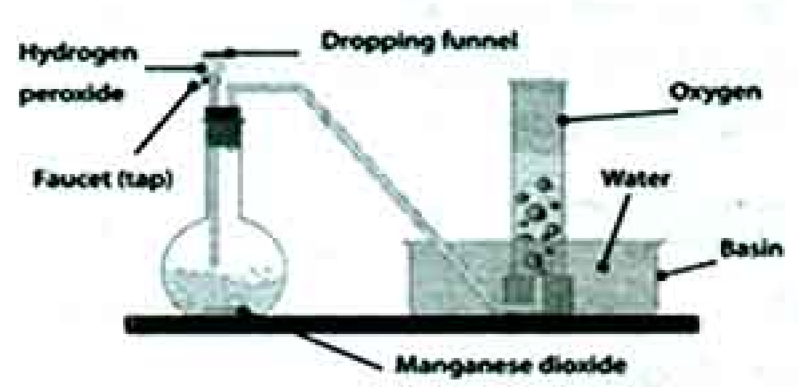
12 1. 1. hydrogen peroxide.
2. oxygen gas.
3. water.
4. flask.
5. manganese dioxide

2. Number 5 is the catalyst which speeds up the rate of the reaction, without any change in its quantity or properties.
3. It is collected by downward displacement of water because it scarcely dissolves in water.

13 Oxygen gas: 21% Nitrogen gas: 78% Carbon dioxide gas: 0.03% and water vapor and other gases (helium - neon - argon).

14 1. Sunlight 2. Carbon dioxide gas
3. Oxygen gas
4. Water and mineral salts
5. Food is formed inside leaves

15



Properties of Oxygen gas

1 1. (c) 2. (b) 3. (b) 4. (a)
5. (a) 6. (a) 7. (d) 8. (a)
9. (d) 10. (a) 11. (a)

2 1. water 2. oxides
3. hydrogen – oxygen
4. the ozone layer
5. combustion (burning) - oxidation (rusting)
6. oxygen
7. two oxygen atoms – ozone
8. respiration - combustion
9. welding - cutting
10. increases
11. air – water
12. harmful ultraviolet rays

3 1. (✓) 2. (✗) does not dissolve.
3. (✓)
4. (✗) and helps in burning
5. (✓) 6. (✓)
7. (✗) three oxygen atoms
8. (✗) does not change 9. (✗) oxidation
10. (✗) slowly 11. (✓)
12. (✗) in the humid air
13. (✗) oxygen 14. (✓)
15. (✓) 16. (✗) increase

4 1. Rust 2. Magnesium oxide
3. Oxidation 4. Burning
5. Oxides 6. Oxygen
7. Ozone 8. Ozone layer
9. Water 10. Oxygen cylinders
11. Oxyacetylene 12. Acetylene

5 1. oxygen 2. Oxygen
3. hydrogen and oxygen
4. three atoms 5. Oxygen
6. scarcely 7. Increases
8. Oxygen 9. painting them

6 1. Because iron reacts with oxygen forming iron oxide.
2. Because oxygen helps in burning.
3. Because oxygen helps in burning.

Model Answers

4. As it causes erosion for iron material such as bridges' pillars.
5. To prevent erosion and rust.
6. Because it protects the earth from harmful ultraviolet radiations.
7. Because oxygen is heavier than air, so it decreases as we rise up above the earth's surface.
8. Because the temperature of oxyacetylene flame is 3500°C which is enough to melt metals, so it is used in welding and cutting metals.
9. Because it is important for respiration process and forms the water molecule.

7
1. The light of the candle will be increased.
2. The nail will rust.
3. They will rust.
4. The mass will increase after heating.
5. Harmful radiations will reach the Earth's surface from the sun.
6. Oxyacetylene flame is formed.

8

1.

Oxidation	Combustion
- It is a slow combination of oxygen with elements in the presence of water	- It is a rapid combination of oxygen with elements and it produces heat and light.

2.

Oxygen molecule	Ozone molecule
It is made of two oxygen atoms.	It is made of three oxygen atoms.

9 (a) oxygen gas (b) ozone (c) water

10
1. It is a slow combination of oxygen with elements in the presence of water.
2. It is a rapid combination of oxygen with elements and it produces heat and light.

11
1. It protects the earth from harmful rays coming from the sun.
2. It is used in welding and cutting metals.

TIMSS Like Questions on Lesson 1

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1 a. iron b. oxygen and water
c. by painting

2
a. Investigate the materials needed to rust iron.
b. Oxygen and water.
c. Because it is covered with an oil layer.
d. Due to the presence of oxygen and water.

3 Search the internet to make a model of a greenhouse by using simple materials.

2 Carbon dioxide

Checkpoint (1) P. 125

1. consumed - produced.
2. the removal of forests -combustion of fuels
3. suffocation of living organisms -global warming

Checkpoint (2) P. 127

1. limewater
2. calcium hydroxide - calcium carbonate

Benchmark P. 129

1
1. carbon dioxide gas.
2. carbon dioxide gas.
3. limewater

2 1. a 2. a

3 Dilute hydrochloric acid - calcium carbonate.

4 Due to the formation of calcium carbonate which is insoluble in water.

5
1. Global warming and melting of snow at the top of mountains in the two poles will occur.
2. The clear limewater is turbid.

Checkpoint (3) P. 130

1. tasteless - colorless
2. heavier
3. upward displacement

School Book Exercises on Lesson 2

P. 134

1
1. It causes a rise in the earth's temperature.
2. Plants can't make their food by a photosynthesis process.

2
1. carbon dioxide - oxygen - oxygen - carbon dioxide.
2. 0.03% – CO_2.
3. pressure – cooling – dry ice.

3
1. Because it doesn't burn and doesn't help in burning.
2. To make it porous and tasty.
3. Due to the formation of calcium carbonate which is insoluble in water.
4. Due to the removal of forests and the combustion of massive amount of fuels in factories.

Al-Adwaa Exercises on Lesson 2

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Carbon Dioxide Gas (structure - sources - harms and preparation)

1

1. (d)	2- (a)	3. (b)	4. (c)
5. (d)	6. (d)	7. (c)	8. (c)
9. (c)	10. (a)	11. (a)	12. (d)

2
1. carbon - oxygen. 2. organic - oil - wood.
3. carbon dioxide.
4. carbon dioxide - clear limewater.
5. dilute hydrochloric acid - calcium carbonate.
6. upward - air - heavier.
7. downward - dissolves.
8. carbon dioxide. 9. suffocation.
10. Limewater.
11. carbon dioxide - calcium carbonate.
12. photosynthesis - respiration process.

3
1. (✓) 2. (✓)
3. (✗) upward 4. (✓)
5. (✓) 6. (✓)
7. (✗) carbon dioxide
8. (✗) carbon dioxide

4
1. Carbon dioxide
2. Carbon dioxide
3. Global warming
4. Carbon dioxide
5. Respiration
6. Photosynthesis process.
7. Carbon dioxide
8. Dilute hydrochloric acid
9. Clear limewater
10. Upward displacement of air
11. Carbon dioxide

5
1. oxygen – carbon
2. calcium carbonate
3. calcium carbonate
4. increasing
5. photosynthesis

6
1. Due to the increase in carbon dioxide percentage in the air which increases the temperature of the earth.
2. As they absorb carbon dioxide to perform photosynthesis.
3. Because limewater becomes milky when carbon dioxide gas passes through it.
4. Because it dissolves in water easily.
5. Because it is heavier than air.

7
1. Causing global warming and suffocation of living organisms.
2. Carbon dioxide percentage increases causing global warming.
3. Limewater becomes turbid.
4. Carbon dioxide will be produced
5. Carbon dioxide is formed.

8

Respiration	Photosynthesis
1. O_2	1. CO_2
2. CO_2	2. O_2

9
1. Respiration of all living organisms during exhaling and burning of organic compounds such as wood, coal, oil, gasoline and tobacco.
2. Detection of the presence of carbon dioxide.

Model Answers

10 a. 1. 1. funnel 2. tap
3. glass flask with stopper with two holes
4. dilute hydrochloric acid
5. calcium carbonate
2. By upward displacement of air.
3. It becomes turbid.
b. It is essential for making photosynthesis process.
c. It is used in refrigeration

11 1. Refers to page 128 2. Refers to page 126
3. Refers to page 126

Properties and Importance of Carbon dioxide gas

1 1. (a) 2. (b) 3. (d) 4. (c)
5. (b) 6. (d) 7. (b)

2 1. burn.
2. colorless - odorless, tasteless – heavier than air.
3. carbon dioxide
4. carbon dioxide - porous – tasty
5. pressure – cooling
6. dry ice - refrigeration
7. fermentation
8. magnesium oxide - carbon.

3 1. (✗) carbon dioxide
2. (✗) and does not help in burning.
3. (✗) carbon dioxide gas
4. (✓)
5. (✗) by yeast 6. (✓)
7. (✓) 8. (✓)
9. (✗) is lighter than
10. (✗) easily

4 1. Yeast 2. Carbon dioxide

5 1. easily 2. carbon dioxide
3. white 4. white
5. carbon dioxide

6 1. Because it does not burn and does not help in burning.
2. Due to producing white magnesium oxide and black carbon.
3. To make bread porous and tasty.
4. Because it is needed for the photosynthesis process made by green plants.

7 1. Lighted candle is put out.
2. White powder of magnesium oxide and black carbon will be produced
3. Bread will be spongy, as yeast produces carbon dioxide by fermentation and carbon dioxide expands due to the heat, making bread porous and tasty.
4. Increasing the ratio of carbon dioxide in blood, and therefore it will cause bones diseases.

8 1. • It is colorless and odorless.
• It is heavier than air.
• It easily dissolves in water.
• It does not burn and does not help in combustion.
• Magnesium ribbon keeps burning for a short time, then extinguishes and white magnesium oxide is produced with black carbon deposits on the wall.
2. • It is used in refrigeration by making dry ice.
• In extinguishing fires.
• It is used to make soft drinks.
• It is used to make bread bubbled.
• It contributes in the photosynthesis process.

9 Refers to page 130

TIMSS Like Questions on Lesson 2
P. 143

1 a. A. flask B. cylinder.
b. Calcium carbonate + hydrochloric acid ⟶ calcium chloride + carbon dioxide + water.
c. (i) Because carbon dioxide gas does not burn and does not help in burning.
(ii) Density of carbon dioxide is more than density of air.

2 1. Yes
2. Because the percentage of carbon dioxide gas year 1960 is 0.031 this ratio reached to 0.037 year 2005 which causes increasing the Earth's temperature.

3 Search the internet for the global warming.

3 Nitrogen

Checkpoint (1) P. 145

A) 1. gaseous 2. two - N_2

B) 1. Nitrogen gas 2. Rutherford

Checkpoint (2) P. 147

1. Nitrogen gas 2. Nitrogen gas

3. Nitrogen gas

Benchmark P. 149

1 1. Nitrogen gas 2. Nitrogen gas
3. Nitrogen oxide 4. Legumes
5. Atmospheric air

2 Because nitrogen is the main component of proteins that build up tissues of living organisms.

3 Fixing nitrogen in the roots of legumes to build up its proteins.

4 1. (b) 2. (b)
3. (c)

School Book Exercises on Lesson 3 P. 152

1 1. (✓) 2. (✗) lifeless 3. (✗) nitrogen

2 1. (b) 2. (a) 3. (d)

Al-Adwaa Exercises on Lesson 3 P. 153

Nitrogen Gas (structure and existence)

1 1. (b) 2. (d) 3. (c) 4. (b)
5. (c) 6. (a) 7. (b) 8. (b)
9. (a)

2 1. gaseous 2. two - N_2
3. nitrogen
4. bacteria - the root
5. Protein 6. 78% - tissues
7. Because it does not help in burning and is not included in the process of respiration.
8. acidic rainwater
9. lightning

3 1. (✓) 2. (✗) two nitrogen atoms
3. (✗) nitrogen 4. (✗) 78%
5. (✓) 6. (✓)
7. (✗) lifeless 8. (✗) nitrogen

4 1. Nitrogen 2. Nitrogen
3. Nitrogen 4. Nitrogen
5. Daniel Rutherford 6. Nitrogen oxides

5 1. air 2. Nitrogen
3. Lifeless 4. nitrogen

6 1. Because it does not help in burning and is not included in the process of respiration.
2. Because nitrogen forms the protein inside legumes.
3. As it takes part in the composition of all living tissues in all living organisms.

7 1. The protein substance that builds up the bodies of all living organisms is not formed.
2. Forming nitrogen oxides.
3. Legumes as clover and peas can't make protein.

8 Fix nitrogen in the roots of legumes to build proteins.

Importance and uses of Nitrogen Gas

1 1. (b) 2. (b) 3. (a) 4. (c)
5. (c) 6. (b) 7. (b) 8. (b)

2 1. nitrogen 2. car tires – lamps
3. stainless steel 4. filling tires

3 1. (✓) 2. (✗) scarcely
3. (✓)

4 1. Nitrogen 2. Nitrogen
3. Nitrogen 4. Nitrogen

Model Answers

5 1. Nitrogen 2. nitrogen
3. Nitrogen 4. nitrogen
5. Nitrogen

6 Because it causes relative constancy of the volume of car tires when the temperature changes.

7 1. carbon dioxide gas
2. oxygen
3. oxygen 4. carbon dioxide
5. oxygen 6. carbon dioxide
7. carbon dioxide 8. carbon dioxide
9. oxygen 10. oxygen
11. oxygen 12. nitrogen
13. ozone

8

1.

Nitrogen	Carbon dioxide
Two nitrogen atoms	One carbon atom + two oxygen atoms

2.

Oxygen	Nitrogen
It does not burn, but helps in burning.	It does not burn and does not help in burning.
21%	78%

9
- It is used in filling car tires.
- It contributes in composing gunpowder.
- It is used in manufacturing of ammonia and ammonium nitrates, which are included in the composition of soil fertilizers.
- It is used to make stainless steel.
- Small amounts of nitrogen are used to fill some types of lamps.

TIMSS Like Questions on Lesson 3

P. 159

1 Air is a mixture of different gases, oxygen gas (21%) and nitrogen gas (78%).

2 (i) 78 %
(ii) Carbon dioxide and helium.

3 c. Material (1) is carbon dioxide gas, and Material (2) is nitrogen gas.

4 Search the internet for the liquid nitrogen.

Unit 4 Structure and Function of Living Organisms

1 Human Nervous System

Checkpoint

P. 165

1. Neuron 2. Dendrites
3. Myelin sheath.

Benchmark

P. 171

1 1. Neuron.
2. Central nervous system.
3. Medulla oblongata.

2 1. (✓) 2. (✗)

3 1. To protect it.
2. Because it's responsible for the involuntary movements such as heartbeats.

4 1. cerebrum, cerebellum, medulla oblongata.
2. myelin.
3. cerebrum.

School Book Exercises on Lesson 1

P. 178

1 1. 12 2. H
3. the body's balance 4. dendrites
5. spinal cord

2 1. Reflex action 2. Spinal cord
3. Nerve cell 4. Medulla oblongata
5. Spinal cord

Model Answers

3 1. At the back area of the brain below the cerebral hemisphere.
2. In the vertebral column.
3. The upper part of the brain inside the skull.
4. It lies in front of the cerebellum.

4 1. It is responsible for regulating the involuntary processes of the body such as heartbeats.
2. It delivers nerve messages from body organs to the brain and vice versa and controls the reflex action.
3. It protects the brain.
4. Keeping the body balance during movement.
5. It controls the voluntary movements of the body, receives nerve impulses and contains centers of thinking and memory.

5 1. Affecting passively nervous system and exhausting sensory organs.
2. Withdrawing of the finger quickly.
3. Affecting the nervous system passively.
4. Blinking of eyelids.

6 1. Because it's responsible for regulating involuntary processes such as heartbeats, breathing and digestion.
2. To protect them.
3. Because it affects sleeping periods which leads to the nervous tension.
4. Due to the reflex action.

Al-Adwaa 1 Exercises on Lesson

P. 180

Function of the nervous system and structure of neuron

1 1. (c) 2. (b) 3. (a) 4. (d) 5. (a)

2 1. the nervous system
2. the nervous system
3. nerve cell (neuron) 4. cell body – axon
5. Axon 6. terminals
7. Synapse
8. nucleus – cytoplasm 9. myelin
10. terminals - synapse

3 1. (✗) nervous system
2. (✓) 3. (✗) neuron's cell body
4. (✓) 5. (✓) 6. (✓)

4 1. Nervous system 2. Nervous system
3. Cell body 4. Axon
5. Terminals 6. Myelin sheath
7. Synapse

5 1. nervous system 2. nervous system
3. axon 4. dendrites
5. Fatty layer

6 1. Because it:
a) carries nerve messages from one area of the body to another one.
b) regulates and coordinates all the vital processes within the body.
c) receives the external stimuli.
2. They are connected to the neighboring neurons forming synapses.

7 There will be no connection with neighboring nerve cells.

8 1. It is the body system which is responsible for communication and control.
2. It is the building unit of the nervous system.
3. They are branches extending from the cell body.
4. It is the connection between neighboring neurons.
5. A fatty layer that surrounds the axon.

9 1. a) It carries nerve messages from one area of the body to another.
b) It regulates and coordinates all the vital processes within the body.
c) It receives the external stimuli.
2. The building unit of nervous system.
3. They are connected to muscles or form a synapse with other neurons.
4. They are connected to neighboring neurons forming the synapse.

10 1. neuron.
2. 1. terminals. 2. myelin sheath.
3. dendrites. 4. cytoplasm.
5. nucleus. 6. axon.
7. cell body.

Model Answers

Structure of the central nervous system

1
1. (b) 2. (a) 3. (d) 4. (b)
5. (a) 6. (c) 7. (b) 8. (a)
9. (d) 10. (d) 11. (a) 12. (a)

2
1. central – peripheral
2. brain - spinal cord
3. nerve cells
4. brain – skull
5. cerebellum - medulla oblongata
6. gray matter – white
7. Cerebrum
8. convolutions – folds
9. voluntary – running
10. Cerebellum
11. Cerebellum
12. medulla oblongata
13. medulla oblongata - spinal cord
14. Backbone
15. H - white matter
16. skull – backbone
17. cerebrum - medulla oblongata
18. medulla oblongata – cerebrum
19. death

3
1. (✗) medulla oblongata
2. (✗) cerebrum
3. (✓)
4. (✗) brain
5. (✓)
6. (✗) in front of
7. (✗) involuntary
8. (✓)
9. (✗) spinal cord
10. (✗) in the brain
11. (✗) medulla oblongata
12. (✓)

4
1. central nervous system.
2. cerebrum (brain).
3. brain.
4. brain.
5. brain.
6. cerebrum.
7. cerebrum.
8. cerebellum.
9. medulla oblongata.
10. spinal cord.
11. cerebellum.
12. skull.
13. backbone.
14. spinal cord.

5
1. cerebrum
2. skull
3. Cerebrum
4. cerebellum
5. medulla oblongata
6. medulla oblongata
7. gray
8. spinal cord

6
1. To protect it.
2. Because it directs and coordinates all the processes, ideas, behaviors and emotions.
3. Because it contains the centers of thinking and memory, controls voluntary movement and receives nerve impulses from sense organs.
4. For keeping the body balance during movement.
5. Because it is responsible for regulating the involuntary processes of the body such as heartbeats, breathing and digestion.
6. Because it is responsible for involuntary processes such as heartbeats.
7. To protect it.

7
1. The person loses his balance during movement.
2. It causes death.

8
1. It is the main control center in the body
2. It protects the spinal cord.

9

Brain	Spinal cord
1. A nerve block containing millions of nerve cells.	1. A cylindrical cord from which the spinal nerves extend and it consists of gray matter which has a shape of letter (H) surrounded by white matter.
2. In the skull.	2. Inside the backbone.
3. It is the main control center in the body.	3. It delivers nerve messages from body organs to the brain and vice versa and controls the reflex action.

10
1. spinal cord.
2. 1. white matter. 2. gray matter.
3. It's responsible for the reflex action.
4. It extends within a canal inside a series of vertebrae (backbone)

Model Answers

Structure of the peripheral nervous system - reflex action - how to keep the system healthy

1 1. (a) 2. (a) 3. (a) 4. (c) 5. (d) 6. (a)

2
1. cranial nerves - spinal nerves
2. cranial nerves - 12 pairs
3. spinal nerves - 31 pairs
4. spinal cord - body balance
5. reflex action 6. spinal cord
7. reflex action
8. sleeping periods – heartbeats
9. tranquilizers - addiction

3
1. (✓) 2. (✗) 31
3. (✗) 31 pairs of spinal nerves and 12 pairs of cranial nerves
4. (✓)
5. (✓)

4
1. Peripheral nervous system.
2. Cranial nerves. 3. Spinal nerves.

5
1. cranial 2. spinal nerves
3. 12 4. 31
5. spinal cord

6
1. Due to the reflex action.
2. Because of the reflex action.
3. Because they affect sleeping periods and heartbeats and lead to the nervous tension.
4. Because they affect sleeping periods and heartbeats and lead to the nervous tension.
5. Because they passively affect the nervous system.
6. Because it passively affects the nervous system as it causes retardation of memory and learning, nervous tension, sluggishness, loss of time sensation and sleeplessness.
7. To keep the nervous system healthy.

7
1. Withdrawal of the hand quickly.
2. Decreasing sleeping periods and increasing heartbeats.
3. Affecting the nervous system passively.
4. Affecting the nervous system passively.
5. Causing retardation of memory and learning. - nervous tension - sluggishness – loss of time sensation - sleeplessness

8
1. Nerves that emerge from the brain.
2. Nerves that emerge from spinal cord.
3. It is the automatic response of the body to different stimuli.

9
1. It delivers sensory information and kinetic responses between the central nervous system and all the body parts.
2. The spontaneous response of the body to different stimuli.

10

Cranial nerves	Spinal nerves
1. emerge from the brain.	1. emerge from the spinal cord.
2. 12 pairs.	2. 31 pairs.

Central nervous system	Peripheral nervous system
1. Brain and spinal cord.	1. Cranial and spinal nerves.
2. It directs and coordinates all the processes, ideas and emotions.	2. It delivers sensory information and kinetic responses between the central nervous system and all the body.

11 1. (d) 2. (a) 3. (c) 4. (b) 5. (f) 6. (e)

12
1. Branches extend from the neuron's cell body.
2. Nerve endings from axon.
3. In the skull.
4. The outer part of the brain.
5. The outer part of the cerebrum.
6. The inner part of the cerebrum.
7. The inner part of the spinal cord.
8. The outer part of the spinal cord.

Model Answers

13 1. Reducing the intake of the stimulating substances.
2. Staying away from stimulants and tranquilizers.
3. Avoiding extreme exciting situations.
4. Doing physical exercises.
5. Staying away from addiction.

TIMSS Like Questions on Lesson 1

P. 193

1 a. response b. spinal cord

2 To keep our body away from dangers.

3

Function	The name of the responsible part of the body
Used for thinking	Cerebrum
Responsible for reflexes	Spinal cord
Keeping the balance of the body	Cerebellum

4 Refers to page 166.

2 Human Locomotory System

Checkpoint P. 198

1. Locomotory system
2. Skull
3. Rib cage

Benchmark P. 201

1 1. Skull. 2. Backbone.
3. Rib cage.
4. The appendicular skeleton.

2 1. axial, appendicular.
2. 33 , 12.
3. joints in skull, shoulder joints.

3 The body can't move.

4 To protect them.

5 1. freely movable joints, slightly movable joint.
2. all directions, one direction only.

School Book Exercises on Lesson 2

P. 204

1 1. The axial skeleton
2. The backbone
3. The appendicular skeleton
4. The joint

2 1. slightly movable
2. slightly movable
3. freely movable

3 The thigh will move in one direction

4 1. (✗) the upper limb 2. (✗) slightly
3. (✗) freely movable 4. (✗) each other

Al-Adwaa Exercises on Lesson 2

P. 205

Structure of the skeletal system (axial and appendicular)

1 1. (a) 2. (d) 3. (b) 4. (a)
5. (c) 6. (b) 7. (d) 8. (d)
9. (b) 10. (d) 11. (b) 12. (b)

2 1. skeletal – muscular 2. Movement
3. axial – appendicular
4. skull - backbone - rib cage
5. eye - ears – nose 6. skull
7. 33 – 12 8. 33
9. Sternum
10. upper limbs - lower limbs.
11. shoulder bones - humerus bone - hand bone
12. pelvic bones - femur - shaft bone
13. skeletal system - muscular system – nervous system
14. cartilages 15. Backbone
16. lungs - heart 17. rib cage
18. bones of upper limps

Model Answers

3 1. (✓) 2. (✓)
3. (✗) 33 4. (✗) ribs
5. (✗) upper limbs 6. (✓)
7. (✗) pelvic 8. (✗) cartilages
9. (✗) brain 10. (✓)

4 1. Locomotory system 2. Locomotory system
3. Movement 4. Skull
5. Cartilage 6. Backbone
7. Backbone 8. Rib cage
9. Sternum 10. Rib cage
11. Humerus 12. Femur

5 1. appendicular 2. rib cage
3. 33 4. Ribs
5. heart 6. 10
7. Exhalation 8. Muscles
9. shoulder 10. pelvic

6 1. Because it depends on participation of the skeletal system, the muscular system and the nervous system.
2. To protect it.
3. Because it protects the spinal cord and allows the body to bend in different directions.
4. To protect it.
5. To prevent their friction during movement.
6. To protect them.
7. Because they allow eating drinking, writing and holding things.
8. Because they allow walking, running, standing and sitting in addition to carrying the rest of the body.

7 1. The body will not be able to bend in different directions.
2. Friction between vertebrae will occur during movement leading to damaging of these vertebrae.

8 1. It protects the brain.
2. It protects the heart and lungs and helps in breathing process.
3. It protects the spinal cord and allows the body to bend in different directions.
4. They prevent their friction during movement.
5. They allow eating, drinking, writing and holding things.
6. They allow walking, running, standing and sitting, and they carry the rest of the body.

9 1. (b) 2. (a) 3. (c) 4. (d) 5. (e)

10

1.

Axial skeleton	Appendicular skeleton
• The skull • The backbone • The rib cage	• Bones of the upper limbs. • Bones of the lower limbs.

2.

Upper limb	Lower limb
• Humerus bones. • Forearm bones. • Hand bones.	• Femur. • Shaft bones. • Foot bones.

11 1. (A) skull (B) shoulder bone (C) humerus.
2. protection of the brain

12 1. humerus bones 2. forearm bones
3. hand bones

Joints and their significance to movement

1 1. (b) 2. (a) 3. (c) 4. (c)
5. (b) 6. (d) 7. (c)

2 1. joint.
2. immovable - slightly movable – freely movable.
3. immovable. 4. knee - elbow.
5. freely movable.
6. slightly movable - freely movable.

3 1. (✗) slightly movable
2. (✗) immovable

4 1. Joints 2. Immovable joint
3. Freely movable joint
4. Slightly movable

5 1. joints 2. slightly movable
3. freely movable 4. freely
5. all directions

6 1. Because it can move in one direction only.
2. Because it allows movement in all directions.

Model Answers

7 1. There will be no movement between bones.
2. It will move in all directions.
3. It will move only in one direction.
4. There will be no movement between bones.

8 1. It is the location at which bones meet each other.
2. They do not allow for any movement.
3. They allow for movement in one direction only.
4. They allow for movement in all directions.

9 1. They allow for the movement between bones.
2. They allow for the movement in all directions.

10

Slightly movable joints	Freely movable joints
1. Allow for the movement in only one direction.	1. Allow for the movement in all directions.
2. • Knee joint. • Elbow joint.	2. • Shoulder joint. • Thigh joint.

11 1. immovable. 2. freely movable.
3. freely movable.

12 1. lower limbs
2. 1. femur 2. shaft bone
3. foot bones
3. walking, sitting and carrying the rest of the body.
4. a. pelvic is a freely movable joint
b. knee is a slightly movable joint

TIMSS Like questions on Lesson 2

P. 214

1 1. a) protects and supports the body.
2. c) skeletal, muscular and nervous.

2 (i) (A) humerus bone (B) forearm bones
(C) elbow joint
(ii) allowing the movement in one direction.
(iii) The bone cannot move.

3 a. Skeleton made from bones.
b. (i) helps us to move
(ii) protects internal organs.
c. Skull.

4 Refers to page 196

Second: Ongoing Assessment & Exams

Unit 1 Force and Motion

1 Mass and Weight P. 3

Worksheet 1

1 A) 1. mass
2. two arm scale - one arm scale
3. kilogram or gram
4. increases
5. place
6. kilogram

B) 1. Because the mass does not change by changing the place.
2. To avoid vibrations.

2 A) 1. Kilogram
2. Sensitive scale
3. Kilogram

B) Mass of water = M2 – M1 = 175 – 100
= 75 grams

3 A) 1. equal
2. gram - kilogram
3. 1000
4. mass

B) 1. It is used for measuring mass of jewelry and chemicals in the lab.
2. It is used for measuring the mass of vegetables and fruit.

4 A) 1. (✗) kilogram
2. (✗) gram
3. (✗) balance scale
4. (✗) doesn't change

B) 1. It means that the amount of gold in the ring equals 3 grams.
2. It means that the mass of the chair equals 4 kilograms.

Model Answers

Worksheet 2

1 A) 1. (c)
2. (c)
3. (b)
4. (b)

B) 1. Balance scale: it is used to measure the mass of objects.
2. Spring scale: it is used to determine the weight of objects.

2 A) 1. (✓)
2. (✓)
3. (✗) 20 N
4. (✗) increases

B) 1. Due to the absence of gravity.
2. Because the gravity decreases by moving away from the center of the earth.
3. Because the gravitational force changes from a planet to another.

3 A) 1. spring scale
2. equal
3. the center
4. weight

B) 1. The weight of the object will increase.
2. All bodies will move away from the earth, and will be lost in space as they become weightless.
3. Their weight will decrease.

4 A) 1. weight
2. Newton

B) 1. a. Weight on the earth = 500 N.
b. Weight on the moon = 83.3 N.
c. Mass on the earth = 50 kg.
2. a. 2.5 N b. 0.416 N c. 250 g

Worksheet 3

1 A) 1. constant - place.
2. balance - spring.
3. object mass - planet where the object exists - distance between object and the center of the planet.
4. sensitive balance.
5. decreases.

B) Mass on Earth = $\frac{600}{10}$ = 60 kg
Mass on the moon = 60 kg
Weight on the moon = $\frac{600}{6}$ = 100 N

2 A) 1. (b)
2. (b)
3. (b)
4. (d)

B) 1. The weight of object decreases to half.
2. The body pulls the wire of the spring downwards and the reading of the pointer increases.
3. Its weight decreases to 100 N.

3 A) 1. It attracts all living organisms to the earth's surface which makes them move easily on the earth.
2. It is used to measure large masses.
3. It is used to measure the weight of any object.

B) 1. 300 grams
2. 3 N

4 A) 1. It means that the gravitational force which attracts the body to the earth equals 400 Newton.
2. It means that the weight of the body on the earth equals 300 Newton.

B) 1. Because the earth has greater mass and gravitational force than the moon.
2. Because the gravitational force changes from one place to another.

Model Answers

School Book Exercises on Unit 1
P. 9

1 1. spring scale
2. 2 kg

2 1. balance scale - spring scale
2. the change in place
3. the object's mass, the place where the object exists and the distance between the object and center of the planet.

3

Points of comparison	Mass	Weight
Definition	The amount of matter in an object.	The force by which the body is attracted to earth.
Units of measurement	Gram - Kilogram - Ton	Newton
Devices of measurement	• Balance scale. • Sensitive two-arm scale. • One-arm digital scale • One-arm scale with a pointer	• Spring scale
Direction	• Has no effect on a certain direction	• Its effect is towards the center of the planet.
Effect of different places	• Constant.	• Variable.

4 1. Mass on the moon = 30 kg
2. Weight on the earth = mass × 10 = 30 × 10 = 300 Newton
3. Weight on the moon = weight on the earth / 6 = 300 / 6 = 50 N

Al-Adwaa General Tests on Unit 1
P. 11

Test 1

1 A) 1. balance scale
2. mass
3. weight
4. kg
5. spring scale

B)

Points of comparison	Kilogram	Newton
Definition	It is one of the measuring units of mass that equals the mass of one liter of distilled water at the normal temperature.	It is the measuring unit of weight and it is almost equal to the weight of an object on the Earth's surface whose mass is 100 grams.

2 A) 1. one sixth
2. gram-kilogram.
3. sensitive scale - balance scale.
4. the center of the earth.

B) 1. The weight of this object increases.
2. The weight of the person decreases as the gravitational force of the Earth for this person decreases.
3. The mass remains as it is.

3 A) 1. equal 2. mass
3. two-arm balance scale
4. direct 5. weight

B) Weight on the moon = $\frac{\text{weight on the earth}}{6}$

$60 = \frac{\text{weight on the earth}}{6}$

Weight on the earth = 60 x 6 = 360 N
Weight = mass x 10.

Mass = $\frac{\text{weight}}{10} = \frac{360}{10}$ = 36 kg

4 A) 1. a 2. a 3. b 4. d

B) 1. The amount of matter in an object.
2. The force by which a body is attracted to the earth.

Test 2

1 A) 1. 3 N.
2. balance scale - spring scale.
3. • mass of the object.
• The planet where the object exists.
• The distance between the object and the earth's center.
4. Earth

B) 1. Because as mass increases, weight increases.
2. Because the weight of the apple = its mass (Kg) × 10.
3. Because the mass of the moon is less than that of the earth and as the mass of the planet increases, its gravitational force increases.

2 A) 1. sensitive balance.
2. mass
3. kilogram
4. spring scale
5. balance scale
6. Newton

B) 1. The weight of the object decreases.
2. All objects on the earth's surface don't have weight.

3 A) 1. weight.
2. Equal.
3. decreases
4. weight

B) 1. Weight on the earth = mass x 10
= 80 x 10 = 800 N
2. Mass on the moon = 80 kg.
3. Weight on the moon =

$$\frac{\text{weight on the earth}}{6} = 133.3 \text{ N.}$$

4 A) 1. c 2. d 3. a 4. c

B)

Mass	Weight
1. kg/g	Newton
2. Balance scale	Spring scale
3. No direction.	Towards the center of the earth.
4. Does not change.	Changes by changing the place.
5. It is the amount of matter in an object.	The force by which a body is attracted to the earth.

Unit 2 Thermal Energy

1 Heat Conduction P. 17

Worksheet 4

1 A) 1. higher - lower
2. temperature
3. energy - thermometer
4. bad – good
5. paper- glass

B) 1. (✗) 2. (✓) 3. (✗)

2 A) 1. heat insulators
2. temperature
3. heat conductors
4. air

B) 1. Heat doesn't transfer from one body to the other as they have the same temperature.
2. We can't hold them with our hands as aluminum is a good conductor of heat.
3. We can't make handles of cooking pots.

3 A) 1. b 2. b 3. c 4. a

B) 1. Because it is used making and processing food, paper, glass and textile.
2. Because glass doesn't let heat flow through it, while copper allows heat to flow through it.
3. Because copper conducts heat faster than aluminum and iron.

Model Answers

4 A)

Heat conductors	Heat insulators
1. Materials that allow heat to flow through.	Materials that do not allow heat to flow through.
2. Aluminum, copper.	Wood, wool.
3. For making cooking pots.	For making handles of cooking pots.

B) 1. The form of energy that transfers from an object of higher temperature to an object of lower temperature.

2. It is a device that is used to measure the temperature.

Worksheet 5

1 A) 1. copper
2. wood – plastic
3. Heat insulators - woolen clothes
4. gaps

B) 1. aluminum
2. copper
3. different

2 A) 1. Accidents can occur easily because of the expansion of bars during summer.
2. Your hand's temperature will decrease.

B) 1. They are used for making cooking pots and kettles.
2. They are used for making handles of cooking pots and irons.
3. It is used in our daily life as cooking and in industry as food, paper, glass and textiles.

3 A) 1. Because it does not allow heat to flow through.
2. Because they are good conductors of heat.
3. To keep our bodies warm as they prevent the leakage of heat.

B) 1. (✗) temperature
2. (✗) hot to cold
3. (✓)
4. (✗) heat insulators

4 A) 1. They are materials that allow heat to flow through.
2. It is the degree of hotness or coldness of a body.

B) 1. b
2. a
3. c

C) 1. Thermometer.
2. Heat insulators.
3. Heavy woolen clothes. 4. Heat.

2 Measuring Temperature P. 21

Worksheet 6

1 A) 1. mercury.
2. the medical thermometer - the Celsius thermometer.
3. medical.
4. volume - temperature. 5. touch.

B) 1. (c)
2. (a)
3. (b)
4. (c)

2 A) 1. (✓)
2. (✗) 10.
3. (✗) 37

B) 1. Mercury will return back quickly to the mercury bulb before determining the temperature reading.
2. It will be damaged.

3 A) 1. constriction.
2. mercury bulb.
3. ethyl alcohol.

B) 1. Because
1. It is a good conductor of heat.
2. It is a liquid silver metal that can be seen.
3. It expands regularly by heat.
4. It is in a liquid state between – 39°C and 357°C.

2. To prevent mercury from going back to the bulb quickly.

Model Answers

4 A) 1. c
2. d
3. a
4. b
5. e

B) 1. heating
2. wide
3. zero
4. zero

Worksheet 7

1 A) 1. b
2. c
3. d
4. a

B) 1. medical thermometer
2. It is used to measure the temperature of the human body.
3. mercury

2 A) 1. boiling
2. human body
3. shake

B) 1. digital thermometer
2. 100°C
3. the medical thermometer

3 A) 1. In order not to break it as mercury is toxic.
2. Because its scale is from 35˚C to 42˚C, while water boils at 100˚C, so the thermometer would be broken.
3. Because mercury is very toxic.

B) 1. Microbes can transfer easily and may be infected by some diseases.
2. Mercury will not go back to the bulb. We can't measure the temperature accurately.
3. It will not give an accurate measurement.

4 A)

Medical thermometer	Celsius thermometer
1. Measures the temperature of the human body.	• Measures the temperature of liquids.
2. 35˚C – 42˚C.	• 0˚C – 100˚C.
3. Mercury.	• Mercury.
4. Has a constriction.	• Has no constriction.

B) 1. It is a liquid metal used in making thermometers and helps in measuring the temperature.
2. It is used to sterilize the medical thermometer to kill microbes.

School Book Exercises on Unit 2

P. 25

1 1. thermometer.
2. Celsius thermometer, medical thermometer.
3. aluminum, copper and stainless steel.
4. wood, plastic and glass.

2 1. thermometer. 2. heat conductors.
3. heat insulators.

3

Point of comparison	Good conductors of heat	Bad conductors of heat
Uses	Making cooking pots (utensils) and kettles.	Making handles of cooking pots, electric irons and kettles.

4 a)

Points of comparison	Medical thermometer	Celsius thermometer
Usage	• It is used to measure the temperature of the human body.	• It is used to measure the temperature of liquids or weather.
Structure	1- A transparent thick glass tube. 2- A capillary tube closed from one of its ends. 3. A mercury bulb that is filled with mercury and connected to the other end of the capillary tube.	
Used liquid	• Mercury.	• Mercury.
Scale	• From 35°C to 42°C.	• From 0°C to 100°C.

Model Answers

b)

Points of comparison	Good conductors of heat	Bad conductors of heat
Definition	• They are materials that allow heat to flow through.	• They are materials that do not allow heat to flow through.
Usage	• Making cooking pots (utensils) and kettles.	• Making of the handles of cooking pots, electric irons and kettles.
Examples	• aluminum, iron, copper, stainless steel	• wood, plastic, glass, paper liquids, gases (air)

5 1. (✗) Celsius thermometer
2. (✗) From 0°C to 100°C
3. (✗) good conductor 4. (✗) bad conductor

6 1) Because:
1. It is a liquid metal that can be seen easily through the capillary tube.
2. It is a good conductor of heat.
3. It expands regularly to give an accurate measurement.
4. It does not stick to the walls of the capillary tube.
5. It remains liquid between (-39°C) and (357°C), so it gives a wide range for measuring temperature.

2. Because plastic and wood are heat insulators
3. Because stainless steel and aluminum are good conductors of heat.
4. To prevent mercury from going back to the bulb quickly in order to read the temperature easily.

Al-Adwaa General Tests on Unit 2

P. 27

Test 1

1 A) 1. hotness - coldness.
2. heat.
3. 35°C – 42°C.
4. 10.
5. liquid - good.

B) The idea of making the thermometer is the change in the volume of liquids as the temperature changes.

2 A) 1. b
2. c
3. a
4. a
5. b
6. b

B) 1. To avoid train accidents.
2. To kill microbes.

3 A) 1. the medical thermometer.
2. zero.
3. mercury.
4. copper.

B) 1. To measure temperature.
2. It is used to sterilize the medical thermometer.

4 A) 1. (✓)
2. (✓)
3. (✗) 37°C
4. (✓)

B) 1. It will not be easy to handle it during cooking.
2. Mercury will return back quickly to the mercury bulb before determining the temperature reading.

Model Answers

Test 2

1 A) 1. c 2. c 3. c 4. a 5. b

B) 1. Heat.
2. The medical thermometer.
3. Constriction.
4. Heat insulators.

2 A) 1. b 2. d 3. a 4. c

B) 1. To prevent mercury from going back to the bulb quickly.
2. Because it has a toxic substance which is mercury.
3. Because it remains liquid between (-39°C) to (357°C).

3 A) 1. (✗) heat insulator.
2. (✓)
3. (✗) using ethyl alcohol.
4. (✗) all metals.

B) 1. the medical thermometer.
2. 1. the mercury bulb.
2. constriction. 3. glass tube.
4. capillary tube.
3. measuring the temperature of the human body.

4 A) 1. liquids. 2. different.
3. aluminum and stainless steel.
4. expands. 5. 37

B) Because:
1. It is a good conductor of heat.
2. It is a liquid metal that can be seen easily through the capillary tube.
3. It does not stick to the walls of the capillary tube.
4. It expands regularly by heat.
5. It remains in a liquid state between – 39°C and 357°C.

Unit 3 The Atmosphere

1 Oxygen P. 33

Worksheet 8

1 A) 1. green plants
2. two
3. nitrogen – oxygen
4. hydrogen peroxide

B) 1. Because it is compensated by the green plants during the photosynthesis process.
2. Because oxygen scarcely dissolves in water.
3. To act as a catalyst that speeds up the reaction and dissociates hydrogen peroxide into water and oxygen.

2 A) 1. atmosphere
2. manganese dioxide
3. oxygen
4. respiration

B) 1. photosynthesis
2. water.
3. downward

3 A) 1. d
2. c
3. d
4. b

B) 1. 1. hydrogen peroxide.
2. oxygen gas.
3. water.
4. flask.
5. manganese dioxide.
2. Number 5 is a catalyst which speeds up the rate of the reaction, without any change in its quantity or its properties.
3. It is collected by downward displacement of water because it scarcely dissolves in water.

Model Answers

4 A) 1. The process that is performed by green plants that absorb carbon dioxide from air to produce food and oxygen.
2. The chemical material which is used to make reaction go faster without any change in its quantity and properties.

B) 1. The harmful ultraviolet radiations will reach the Earth from the outer space.
2. The living organisms can't respire.
3. Answer by yourself.

Worksheet 9

1 A) 1. (✗) and help in burning.
2. (✓).
3. (✗) increases.
4. (✗) white powder.
5. (✓)

B) Answer by yourself.

---

2 A) 1. Because the temperature of oxyacetylene flame reaches 3500 C which is sufficient to cut or weld metals.
2. Because the ratio of oxygen gas decreases when we rise above the earth's surface.

B) 1. c 2. d
3. b 4. a

---

3 A) 1. ozone
2. acetylene - oxygen
3. rarely
4. oxygen

B) 1. Iron will combine with oxygen in the presence of moisture (water) so iron nails will rust.
2. They will rust.
3. The burning fragment is still burning.

4 A) 1. catalyst
2. magnesium oxide
3. acetylene
4. combustion

B) 1. c 2. c 3. c
4. a 5. b

2 Carbon dioxide

P. 37

Worksheet 10

1 A) 1. calcium carbonate.
2. two - one.
3. carbon dioxide.
4. increasing.

B) 1. Carbon dioxide 2. CO_2 3. CO_2

---

2 A) 1. c 2. c 3. c 4. c

B) 1. 1. funnel.
2. CO_2
3. a glass flask with a stopper with two holes.
4. cylinder.
5. dilute hydrochloric acid.
6. calcium carbonate.
2. By upward displacement of air.
3. It becomes turbid.

---

3 A) 1. Limewater turns into milky due to the presence of carbon dioxide in the exhaled air.
2. Green plants can't make photosynthesis process, so the percentage of oxygen will decrease in the atmosphere and living organisms will die.

B) 1. easily dissolves in water
2. clear limewater.
3. photosynthesis.
4. carbon dioxide.
5. carbon dioxide.
6. organic -respiration.

4 A) 1. (✗) carbon dioxide.
2. (✓)
3. (✓)

B) 1. Because it is heavier than air.
2. Because insoluble calcium carbonate is formed making the solution turbid.

Worksheet 11

1 A) 1. dry ice.
2. burn - help in burning.
3. upward-air-heavier.
4. magnesium oxide.

B) 1. carbon
2. fermentation
3. calcium carbonate

2 A) 1. c 2. c 3. c 4. b

B) 1. photosynthesis – produces oxygen – uses carbon dioxide.
2. respiration – releases carbon dioxide – uses oxygen.
3. fermentation – in the bread industry – happens by yeast.

3 A) 1. Because yeast produces carbon dioxide during fermentation which expands by heat making the bread porous and tasty.
2. Because it absorbs CO_2 and gives oxygen gas.
3. Because clear limewater turns into milky when carbon dioxide gas passes through it.

B) 1. easily
2. calcium carbonate
3. carbon dioxide
4. white

4 A) 1. The lighted candle will be extinguished.
2. Carbon dioxide is produced.
3. Dry ice is formed.

B) Answer by yourself.

3 Nitrogen

P. 41

Worksheet 12

1 A) 1. gaseous
2. two – N_2
3. car tires - lamps
4. bacteria - roots

B) 1. Because it does not help in burning and is not included in the process of respiration.
2. Because it takes part in the composition of all living organisms' tissues.
3. To produce fertilizers.

2 A) 1. (✓)
2. (✓)
3. (✗)
4. (✓)
5. (✓)

B) 1. Plants will not take nitrogen to make protein.
2. The protein substance that builds up the bodies of all living organisms is not formed.

3 A) 1. Nitrogen
2. Rutherford
3. Nitrogen
4. Air

B) 1. (b) 2. (b)

4 A) Answer by yourself.

B) 1. nitrogen
2. lifeless
3. nitrogen
4. two
5. nitrogen oxide

Model Answers

School Book Exercises on Unit 3
P. 43

1 a. (✗) nitrogen. b. (✗) 21%

2 Because clear limewater becomes turbid when carbon dioxide passes through it, due to the formation of calcium carbonate which is insoluble in water.

3 a. By putting manganese dioxide (as a catalyst) on hydrogen peroxide (oxygen water) it dissociates into water and oxygen gas.
b. By burning of organic compounds such as wood, carbon dioxide is produced.

4 1. a. Calcium carbonate.
b. Dilute hydrochloric acid.

2. 1. Refrigeration (carbon dioxide is used in making dry ice) which is used in refrigeration.
2. It is used in extinguishing fires.
3. It is used to make soft drinks.

Al-Adwaa General Tests on Unit 3
P. 45

Test 1

1 A) 1. carbon dioxide.
2. acetylene 3. fast
4. carbon dioxide
5. carbon dioxide.

B) 1. Nitrogen.
2. Oxygen.
3. Carbon dioxide.
4. Carbon dioxide.
5. Oxygen.

2 A) 1. b 2. d 3. a 4. a

B) 1. Because it easily dissolves in water.
2. For the relative constancy of its volume at the change of temperature.

3 A) 1. becomes turbid
2. respiration

B) 1. speeds up the chemical reaction
2. It is used to detect the presence of carbon dioxide gas.
3. It is used to weld and cut metals.

4 A) 1. (✗) carbon dioxide.
2. (✗) manganese dioxide.
3. (✓)
4. (✓)
5. (✓)

B) Answer by yourself.

Test 2

1 A) 1. acetylene.
2. Burning (combustion).
3. limewater.
4. dilute hydrochloric acid.

B) 1. The protein substance that builds up the bodies of all living organisms is not formed.
2. Nitrogen dioxide gas will be formed and dissolves in rain.
3. It will extinguish giving white substance of magnesium oxide & a black deposit of carbon.

2 A) 1. e
2. d
3. a
4. b
5. c

B) 1. Because it reacts with oxygen in humid air forming rust of iron oxides.
2. Because it protects the earth from harmful ultraviolet radiations.
3. Because the ratio of oxygen gas decreases when we rise above the Earth's surface.

Model Answers

3 A) 1. (✓) 2. (✓)
3. (✗) carbon dioxide.
4. (✗) scarcely dissolve.

B) Answer by yourself.

4 A) 1. respiration.
2. 78%.
3. lifeless.
4. 3.

B) 1. It is used in extinguishing fires.
2. It is used in refrigeration.
3. It is used in making bread.
4. It takes part in photosynthesis process.

Unit 4 Structure and Function of Living Organisms

1 Human Nervous System P. 51

Worksheet 13

1 A) 1. nervous system
2. nerve cell (neuron)
3. brain – spinal cord
4. thinking – memory
5. brain – spinal cord

B) 1. (✗) 2. (✗) 3. (✗) 4. (✗)

2 A) 1. Nervous system
2. Dendrites
3. Myelin sheath
4. Gray matter

B) 1. There will be no connection with neighboring nerve cells and synapse won't be formed.
2. All the involuntary processes of body will be disturbed causing death.
3. The person loses his balance during movement.

3 A) 1. c 2. a 3. a 4. c

B) Answer by yourself.

4 A) 1. To connect with neighboring neurons to form synaptic area.
2. Because it regulates all vital processes, thinking, behavior and emotions.
3. Because it is responsible for involuntary processes such as heartbeats.

B)

Cerebrum	Cerebellum
1. The largest part of the brain.	• Small part of the brain.
2. The upper part of the brain	• At the back of the brain below cerebrum.
3. Controlling voluntary action/ thinking/memory.	• Balance of the body during motion.

Worksheet 14

1 A) 1. cranial – 12.
2. reflex action.
3. sleeping periods – heartbeats.
4. addiction – stimulants.

B) 1. brain.
2. 31.
3. dendrites.

C) 1. It affects passively sleeping periods and heartbeats causing nervous tension.
2. This affects badly the nervous system.

2 A) 1. It protects the brain.
2. Transferring pulses between the central nervous system and all body parts and vice versa.

B) 1. Because of reflex action.
2. Because it affects passively nervous system and exhausts the sensory organs.

3 A) 1. (✓) 2. (✓) 3. (✓)
4. (✗) gray.
5. (✗) axon terminals

Model Answers

B) 1. It is the building unit of the nervous system.
   2. Nerves that extend from the brain (12 pairs).

C) 1. Withdrawal of the hand quickly when touching a hot surface.
   2. Blinking when something gets close to the eye.
   3. Secreting saliva on seeing or smelling good food.

4 A) 1. d 2. a 3. c 4. b

B)

Brain	Spinal cord
1. A nerve block containing millions of nerve cells.	• A cylindrical cord.
2. In the skull.	• In the vertebral column.
3. The main control center in the body.	• Reflex action. • It delivers nerve message from body organs to the brain and vice versa.

2 Human Locomotory System

P. 55

Worksheet 15

1 1. d 2. b 3. b 4. d 5. b

2 A) 1. (✓) 2. (✓)
   3. (✗) 12 pairs

B) 1. Friction between vertebrae will occur during their movement causing acute pain.
   2. It will be impossible to bend the body in all directions.

3 A) 1. the locomotory system.
   2. the skeletal system.
   3. the skull.
   4. the backbone. 5. the humerus.

B) 1. They allow eating, drinking, writing and holding things.
   2. They allow movement in all directions.

4 A) 1. Because they allow eating, drinking, writing and holding things.
   2. To protect it.
   3. To protect them.

B) 1. A part of the skeletal system made of the skull, the backbone and the rib cage.
   2. It is the location at which bones meet each other.

Worksheet 16

1 A) 1. immovable – freely movable – slightly movable
   2. slightly movable – freely movable
   3. rib cage.
   4. skeletal – muscular
   5. 12

B)

Axial skeleton	Appendicular skeleton
• Skull • Backbone • Rib cage	• Bones of upper limbs • Bones of lower limbs

2 A) 1. 33
   2. spinal cord
   3. freely movable

B) 1. It moves in one direction of the arm.
   2. The hip joint will move in one direction only.
   3. Friction between vertebrae will occur during their movement causing acute pain.

3 A) 1. To prevent their friction during movement.
   2. Because it can move only in one direction.
   3. Because it protects the spinal cord and allows the body to bend in different directions.

B) 1. Axial skeleton.
   2. Cartilages.
   3. Immovable joints.

4 A) 1. slightly movable
2. freely movable
3. immovable
4. freely movable

B) 1. It protects the brain and has cavities for sense organs.
2. It protects the spinal cord and allows movement in all directions.
3. It protects the heart and lungs and helps in breathing.

C) Answer by yourself.

School Book Exercises on Unit 4

P. 59

1 1. nerve cell axon
2. spinal cord
3. two bones
4. immovable

2 a. Nerve cell (Neuron).
b. Spinal cord.
c. Reflex action.
d. Appendicular skeleton.

3 a. It lies above the spinal cord (connects brain to the spinal cord).
b. It lies in the inner area of the spinal cord.
c. It lies at the back area of the brain below the cerebrum.
d. It extends with canal inside a series of vertebrae (the backbone).

4 a. They allow the movement between bones.
b. It protects the lungs and heart (it helps in the inhalation and exhalation processes).
c. It keeps the body's balance during movement.
d. 1. They control the voluntary movements of the body like running in a race.
2. They receive nerve impulses from sense organs and send the appropriate responses.

5 a. Due to the reflex action.
b. Because it is responsible for regulating the involuntary processes, and any damage will affect heartbeats, breathing and that will lead to death.

Al-Adwaa General Tests on Unit 4

P. 61

Test 1

1 A) 1. the brain
2. movement
3. skull - backbone - rib cage
4. dendrites
5. cerebellum

B) 1. Branches extending from the neurons body.
2. The part of the brain that lies at the back area of the brain below the cerebrum and keeps the body balance during movement.
3. The joints which allow movement in all directions.
4. It consists of 33 vertebrae and it protects the spinal cord.

2 A) 1. b 2. d 3. b
B) 1. Because they don't allow any movement.
2. To prevent friction during movement.

3 A) 1. the nervous system
2. the spinal cord.
3. the backbone
4. the rib cage

B) 1. It controls involuntary movement such as heartbeats.
2. It protects the brain.

4 A) 1. (✗) 12 pairs 2. (✓)
3. (✓) 4. (✓)
B) 1. The body will lose its balance.
2. The body will not be able to bend in different directions.

Model Answers

Test 2

1 A) 1. d 2. a 3. d 4. c

B) 1. The backbone.

2. The brain.

3. Joints.

2 A) 1. d 2. c 3. a 4. b

B) 1. Because it controls thinking and memory and voluntary actions

2. Because they permit eating, drinking, writing and holding things.

3 A) 1. (✗) movement

2. (✗) slightly movable

3. (✓) 4. (✗) upper limbs

B) 1. upper limbs.

2. 1. shoulder bones. 2. humerus.

3. forearm (radius - ulna). 4. rib cage.

3. Helps in activities like writing, eating and holding things.

4 A) 1. spinal cord

2. H

3. skull.

B) 1. Avoid stimulants.

2. Avoid sitting in front of the computer and television for a long period.

3. Avoid addiction.

Monthly Exams Answers

P. 68

October Models

Model 1

1. (a)	2. (b)	3. (d)	4. (a)
5. (b)	6. (c)	7. (a)	8. (d)
9. (a)	10. (d)	11. (a)	12. (c)
13. (a)	14. (c)	15. (b)	16. (b)
17. (c)	18. (c)	19. (b)	20. (c)

Model 2

1 1. chemicals – jewelry

2. weightless

3. hot and cold

4. 35°C – 42°C

5. liquid - good

2 1. (c) 2. (a) 3. (a)

4. (a) 5. (d)

3 A.1. Because as the mass of the object increases, its weight increases.

2. To kill microbes.

B. 1. Mass on Earth $= \frac{600}{10} = 60$ kg

2. Mass on the moon = 60 kg

3. Weight on the moon $= \frac{600}{6} = 100$ N

4 A.1. The weight of the object increases.

2. We can't handle them easily.

B. 1. (c)

2. (e)

3. (b)

4. (f)

5. (d)

6. (a)

Model Answers

November Models

Model 1

1. (b) 2. (b) 3. (a) 4. (b)
5. (a) 6. (c) 7. (a) 8. (a)
9. (a) 10. (b) 11. (b) 12. (c)
13. (b) 14. (a) 15. (b) 16. (c)
17. (d) 18. (b) 19. (d) 20. (c)

Model 2

1
1. water
2. magnesium oxide -carbon
3. gas
4. respiration -burning
5. CO_2

2
1. (b)
2. (d)
3. (a)
4. (a)
5. (a)

3
1. Acetylene gas
2. Burning
3. Limewater
4. Hydrochloric acid
5. Nitrogen gas

4 A.
1. Nitrogen gas
2. Oxygen gas
3. Carbon dioxide gas

B.
1. Because it dissolves in water.
2. Due to the photosynthesis process which compensate the consumed oxygen.

December Models

Model 1

1. (a) 2. (a) 3. (d) 4. (a)
5. (a) 6. (a) 7. (a) 8. (a)
9. (c) 10. (a) 11. (d) 12. (d)
13. (b) 14. (c) 15. (b) 16. (c)
17. (d) 18. (c) 19. (b) 20. (b)

Model 2

1
1. Nervous system
2. Movement
3. skull - backbone - ribcage
4. Dendrites
5. Cerebellum

2 1. (b) 2. (d) 3. (b)
4. (a) 5. (d)

3 A.
1. Nervous system
2. Spinal cord
3. Backbone

B.
1. It is responsible for the involuntary movements.
2. It protects the brain.

4 A.
1. Because they allow the motion in all directions
2. To prevent the friction between them

B.
1. medulla oblongata
2. shoulder bone 3. spinal cord

Model Answers

Al Adwaa MCQ Model Exams

P. 82

Model 1

1. (a)	2. (a)	3. (b)	4. (c)
5. (c)	6. (c)	7. (a)	8. (c)
9. (b)	10. (b)	11. (b)	12. (d)
13. (a)	14. (a)	15. (b)	16. (d)
17. (a)	18. (b)	19. (c)	20. (b)

Model 2

1. (d)	2. (c)	3. (d)	4. (c)
5. (a)	6. (b)	7. (a)	8. (a)
9. (b)	10. (d)	11. (c)	12. (a)
13. (b)	14. (a)	15. (c)	16. (a)
17. (a)	18. (a)	19. (b)	20. (c)

Model 3

1. (b)	2. (c)	3. (b)	4. (b)
5. (c)	6. (c)	7. (c)	8. (d)
9. (a)	10. (a)	11. (d)	12. (d)
13. (b)	14. (c)	15. (c)	16. (c)
17. (d)	18. (c)	19. (d)	20. (b)

Model 4

1. (c)	2. (a)	3. (c)	4. (a)
5. (b)	6. (b)	7. (c)	8. (c)
9. (b)	10. (d)	11. (b)	12. (b)
13. (b)	14. (d)	15. (a)	16. (d)
17. (d)	18. (c)	19. (a)	20. (b)

Model 5

1. (b)	2. (b)	3. (d)	4. (b)
5. (d)	6. (d)	7. (d)	8. (b)
9. (a)	10. (a)	11. (c)	12. (b)
13. (b)	14. (c)	15. (c)	16. (a)
17. (a)	18. (d)	19. (b)	20. (b)

MCQ Governorates Exams (2020 - 2021)

P. 92

1 Cairo - El-Zeitoun Educational Directorate

1. (b) 2. (b) 3. (a) 4. (c)

2 Cairo - Al-Sahel Directorate

1. (c) 2. (c) 3. (a) 4. (a)

3 Cairo - Al-Basateen & Dar El-Salam Edu. Directorate

1. (d) 2. (c) 3. (b) 4. (a)

4 Giza - Al-Sheikh Zayed Educational Directorate

1. (d) 2. (c) 3. (a) 4. (d)

5 Giza-EL-Agouza Educational Directorate

1. (a) 2. (d) 3. (d) 4. (c)

6 Giza - Bolaq El-Dakrour Educational Directorate

1. (b) 2. (a) 3. (c) 4. (b)

7 Aswan - Aswan Educational Directorate

1. (c) 2. (a) 3. (d) 4. (d)

8 Sharkia - West Zagazig Educational Directorate

1. (b) 2. (d) 3. (c) 4. (a)

9 Menofia - Berket ElSabaa Educational Directorate

1. (c) 2. (b) 3. (c) 4. (b)

10 Suez - South Educational Directorate

1. (c) 2. (b) 3. (b) 4. (b)

11 Port Said - North Educational Directorate

1. (c) 2. (b) 3. (b) 4. (c)

12 Luxor - Al Qarna Educational Directorate

1. (a) 2. (a) 3. (b) 4. (b)

Model Answers

Combined Model Exams
(Selected from 2019/2020 Governorates Exams)

P. 96

Model 1

1
1. sensitive balance, spring scale
2. upper - lower
3. 35 - 42
4. carbon dioxide gas, oxygen
5. 12 - 31

2
1. mercury
2. carbon dioxide
3. spinal cord
4. medulla oblongata
5. manganese dioxide

3 A) 1. (✓)
2. (✗) 21%
3. (✓)

B) Mass on the moon = 6 kg ,
Weight on the Earth = 6 X 10 = 60 N ,
Weight on the moon = $\frac{60}{6}$ = 10 N

4 A) 1. Nitrogen gas
2. Ozone gas 3. kg

B) 1. Because, they are heat insulators.
2. Because it doesn't dissolve in water.

Model 2

1
1. medical
2. 12 pairs, 31 pairs
3. spring scale -balance scale
4. CO_2 , O_2 5. temperature.

2
1. copper
2. 78
3. immovable
4. cerebrum
5. protein

3 A) 1. Atmosphere
2. Neuron
3. Mercury
4. Oxyacetylene

B) 1. It is responsible for reflex action.
2. It measures the temperature of liquids.

4 A) 1. (✓)
2. (✗) one carbon atom combined with two oxygen atoms.
3. (✗) cerebrum

B) Mass on the moon = 5 kg
Weight on the Earth = 5 x10 = 50 N

Model 3

1
1. balance scale – spring scale.
2. colorless
3. $CO_2 - O_2$
4. CO_2 – calcium carbonate
5. skeletal

2 1. (C) 2. (b) 3. (a) 4. (c) 5. (c)

3 A) 1. (✗) steel
2. (✗) lifeless
3. (✓)
4. (✓)

B) 1. To prevent returning back of mercury to the mercury bulb quickly.
2. To protect them.

4 A) 1. Newton 2. CO_2 3. Brain

B) 1. 0°C – 100°C 2. 78
3. 3500 4. cartilage

Model Answers

Model 4

1 1. 35 – 42
2. cell body – axon
3. slightly movable – freely movable
4. kg – N
5. hydrogen peroxide – manganese dioxide

2 1. mercury
2. CO_2
3. spinal cord
4. cerebellum
5. manganese dioxide

3 A) 1. Spinal cord
2. Medical thermometer
3. Oxyacetylene
4. Kg

B) 1. Because it protects the earth from harmful rays.
2. Because it maintains the body balance.

4 A) 1. Increasing the temperature of the earth
2. It will move in all directions

B) 1. humerus bone
2. ribcage
3. forearm bone
4. ribs

Model 5

1 1. brain – skull
2. hydrogen-peroxide -manganese dioxide
3. 33
4. balance scale
5. decreases

2 1. (c) 2. (b) 3. (d) 4. (d) 5. (c)

3 1. (✓)
2. (✗) 21%
3. (✓)
4. (✓)
5. (✓)
6. (✗) gray

4 A) 1. (c) 2. (f) 3. (d)
4. (g) 5.(a) 6. (b)

B) 1. I move my hand away quickly.
2. The limewater becomes turbid.

Final Exams on the First Term

2019-2020

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1 Cairo - Zeitoun Educational Directorate

1 A) 1. Newton, 100 grams.
2. –39°C - 357°C.
3. combustion, oxidation.
4. carbon dioxide (CO_2), calcium carbonate.

B) W_{Earth} = mass × 10
= 6 × 10 = 60 N

W_{moon} = W_{Earth} ÷ 6
= 60 ÷ 10 = 10 N

2 A) 1. 24.
2. immovable.
3. Protein
4. copper

B) 1. Withdrawal of the hand quickly due to the reflex action.
2. Carbon dioxide gas is produced and expands by heat making the bread porous and tasty.

3 A) 1. spinal cord
2. backbone
3. temperature

B) 1. Due to the removal of forests, and the combustion of massive amount of fuels in factories and means of transportation.
2. To avoid accidents, as iron is a good conductor of heat which expands and twists by heat.
3. Because it regulates the involuntary processes, and any damage will affect the heartbeats, breathing, etc. which will lead to death.

4 A) 1. - Substance (a) is calcium carbonate
- Substance (b) is dilute hydrochloric acid
2. (a) soft drinks
(b) fire extinguishers

B) 1. (✗) nitrogen
2. (✗) upper
3. (✗) manganese dioxide
4. (✗) weight

Model Answers

2 Cairo - St. Joseph's School

1 A) 1. nitrogen
2. regularly
3. nerve
4. skeletal
5. decreases 6. 12.

B) 1. It doesn't allow heat to pass through.
2. It is the system which is responsible for the body movement.
3. They are the branches extending from the cell body of neuron to connect the neighboring neurons forming synapses.

2 A) 1. (✗) the mass does not change
2. (✗) respiration 3. (✓)
4. (✗) cerebrum
5. (✗) cutting and welding of metals
6. (✓)

B) 1. Because it's special type of bacteria (nodular) that live in their roots absorb nitrogen gas to build proteins.
2. Because carbon dioxide gas easily dissolves in water.
3. Because it allows movement in all directions.

3 A) 1. zero
2. both of them
3. 10 N
4. medulla oblongata
5. both of them
6. both of them

B) 1. The nerve message will not be delivered from all body parts to the central nervous system.
2. Withdrawal of the hand quickly due to the reflex action.
3. It turns into milky, due to the formation of calcium carbonate which is a white insoluble substance.

4 A) 1. Photosynthesis
2. Yeast
3. Stimulants
4. Lightning
5. Organic materials
6. Heat

B) 1. When the body loses its balance during movement.
2. When the percentage of CO_2 increases in the air.
3. When there is no gravity on earth.

3 Cairo - Al-Khalifa & Al-Moqattam Zone - Virginia Internationl School

1 A) 1. mass
2. 12 pairs
3. increases
4. cerebellum
5. upward - air
6. Celsius thermometer

B) 1. Carbon dioxide gas is produced.
2. Mercury will return back to the bulb quickly.
3. It will rust (oxidation process).

2 A) 1. (a)
2. (c)
3. (b)
4. (a)
5. (a)
6. (a)

B) 1. Because it regulates involuntary processes, and any damage will affect the heartbeats, breathing, etc. which will lead to death.
2. Because, carbon dioxide gas is produced and expands by heat making the bread porous and tasty.
3. Because it scarcely dissolves in water.

3 A) 1. nerve 2. a) cell body
b) nucleus
c) Myelin sheath

B) 1. Mass $= \frac{W_{Earth}}{10} = \frac{600}{10}$.
$= 60$ Kg

2. $W_{Moon} = W_{Earth} \div 6$
$= 600 \div 6 = 100$ N

C) 1. Immovable joints
2. Freely movable joints

Model Answers

4 A)

P.O.C	Nitrogen	Oxygen	Carbon dioxide
Percentage in air	78%	21%	0.03%
Its symbol	N_2	O_2	CO_2

B) 1. Protects the brain.
2. Responsible for reflex action.
3. Cutting and welding metals.

4 Giza - Experimental Educational Directorate

1 A) 1. cell body, axon
2. dilute hydrochloric acid, calcium carbonate.
3. balance scale, spring scale.
4. axial skeleton, appendicular skeleton.

B) 1. Protects the earth from harmful rays coming from the sun.
2. Keeps the body balance during movement.

2 A) 1. Catalyst
2. Heat insulators
3. Joints
4. Nitrogen

B) 1. To protect them from rust and corrosion.
2. Due to reflex action.

3 A) 1. (b) 2. (b) 3. (c) 4. (b)

B)

P.O.C	Celsius thermometer	Medical thermometer
Usage	measures temperature of liquids	measures temperature of human body
Scale range	$0^{\circ}C$ — $100^{\circ}C$	$35^{\circ}C$ — $42^{\circ}C$

4 A) 1. Cerebrum
2. 12
3. slightly movable

B) Clear limewater turns turbid.

C) 1. spinal cord.
2. Inside the backbone
3. (1) white matter
(2) gray matter

5 Giza - Giza Science Inspectorate

1 A) 1. decreases
2. 100
3. copper
4. calcium carbonate
5. 78%
6. spinal cord
7. 12

B) 1. mass 2. medical

C) 1. Mass on the moon's surface = 20 Kg
2. The weight on the earth's surface = Mass × 10 = 20 × 10
= 200 N
3. The weight on the moon's surface = $W_{Earth} \div 6 = 200 \div 6$
= 33.3 N

2 A) 1. balance scale, spring scale
2. 35, 42
3. photosynthesis, respiration
4. 12,31

B) 1. Clear limewater turns turbid.
2. It will be broken as its scale range ends at $42^{\circ}C$, while the water boils at $100^{\circ}C$.

3 A) 1. Newton
2. Carbon dioxide
3. Medical (clinical) thermometer
4. Neuron (nerve cell)

B) 1. oxygen.
2. (1) hydrogen peroxide
(2) manganese dioxide
(3) oxygen gas

Model Answers

4 A) 1. Because it is a liquid material that can be seen easily through the capillary tube, doesn't stick on the walls of the capillary tube and a good conductor of heat which expands regularly as it has a wide range of measuring temperature.
2. Because it scarcely dissolves in water.
3. Because it doesn't help in burning.
4. To be protected.

B) 1. Cutting and welding of metals.
2. Keeps the body balance during movement.

6 Giza - Giza Educational Administration

1 1. 35°C , 42°C
2. kilogram, Newton
3. photosynthesis, respiration
4. 12 pairs, 31 pairs
5. expand, contract
6. hydrogen peroxide - manganese dioxide

2 A) 1. (✓)
2. (✗) from hot to cold
3. (✓)
4. (✗) good
5. (✓)
6. (✗) does not change

B) 1. Because it doesn't help in burning.
2. Because they are heat insulators.
3. Because it protects the earth from harmful rays coming from the sun.

3 A) 1. Mass
2. Skull
3. Neuron (nerve cell)
4. Joints
5. Reflex action
6. Temperature

B) 1. Mass on the moon = 12 kg
2. Weight on earth = mass × 10 = 12 × 10 = 120 N
3. Weight on the moon = $W_{Earth} \div 6 = 120 \div 6 = 20$ N

4 A) 1. (b)
2. (d)
3. (c)
4. (b)

B) 1. Used in measuring the object's weight.
2. Used in cutting and welding of metals.

7 Alexandria - Middle Zone - Science Inspectorate

1 1. hydrogen peroxide, manganese dioxide
2. gravity, weight
3. hot, cold
4. skeletal, muscular
5. heavier, upward
6. nucleus, Cytoplasm

2 A) 1. kilogram
2. oxyacetylene flame
3. heat conductors
4. brain

B) 1. Regulates involuntary processes such as heartbeats.
2. Measures the temperature of human body.

3 A) 1. (d)
2. (b)
3. (c)
4. (d)
5. (c)
6. (c)

B) 1. Because oxygen rarely dissolves in water.
2. Because aluminum is a heat conductor.
3. Due to the reflex action.

4 A) 1. spinal cord
2. ammonia
3. Newton

B) 1. Mass
2. Nitrogen

Model Answers

C) 1.(1) carbon dioxide gas
(2) dilute hydrochloric acid
(3) calcium carbonate
2. soft drinks, fire extinguishers

8 Qalubia - Qalubia Educational Administration

1 A) 1. copper - aluminum
2. changing place

B) 1. Doesn't burn and doesn't help in burning.
2. Scarcely dissolves in water.

C)

P.O.C	Celsius thermometer	Medical thermometer
Range of scale	0°C — 100°C	35°C — 42°C
Usage	Temperature of liquids.	Temperature of the human body.

2 A) 1. (✓) 2. (✗)

B) 1. The body will lose its balance, because it maintains the balance of the body during movement.
2. The medical thermometer will be damaged because the boiling point of water is 100°C.

C) 1. It's responsible for regulating the involuntary processes of the body as heartbeats.
2. It prevents mercury from returning back to the bulb quickly.
3. It protects the Earth from harmful radiations that come from the Sun.
4. It is used in refrigeration through pressure and cooling processes.

3 A) 1. 4
2. carbonate
3. H
4. nerve cell's axon

B) Answer by yourself.

C) 1. immovable joints
2. slightly movable joints

4 A) 1. Newton
2. Temperature
3. Manganese dioxide
4. Reflex action

B) a) 1- It helps us to know our bodies temperature.
2- It helps us to know the weather temperature.
b) 1- It protects the earth from harmful radiations.
2- It adjusts the temperature of the earth's surface.

C) Answer by yourself.

9 Gharbia - Department of Language Schools Supervision

1 A) 1. mass
2. faster
3. carbon dioxide gas
4. lightning
5. axon
6. brain

B) 1. Mass on moon = 30 kg.
2. Weight on the earth = W_{Earth} = mass × 10 = 30 × 10 = 300 N
3. Weight on the moon = W_{Moon} = W_{Earth} ÷ 6 = 300 ÷ 6 = 50 N

2 A) 1. (c)
2. (a)
3. (a)
4. (c)
5. (a)
6. (b)

B) 1. Clear limewater will turn turbid.
2. Withdrawal of the hand quickly due to the reflex action.

3 A) 1. Newton
2. Heat conductors
3. Catalyst
4. Oxygen
5. Neuron
6. Appendicular skeleton

Model Answers

B) 1. To prevent mercury from returning back to the bulb quickly.
2. Because they affect sleeping periods and heartbeats and lead to nervous tension.

4 A) 1. (✗) good
2. (✓)
3. (✗) oxygen gas
4. (✓)
5. (✓)
6. (✗) 12 pairs

B) 1. oxygen gas
2. (1) hydrogen peroxide
(2) manganese dioxide
(3) water
(4) oxygen gas

10 Kafr Al-Sheikh - Science Inspectorate

1 A) 1. gram
2. nitrogen
3. cerebellum
4. 33

B) 1. Spring scale.
2. Newton.

2 A) 1. b) but it helps in burning
2. a) indicates the presence of carbon dioxide
3. d) is a freely movable joint
4. c) are the main sources of oxygen in the air.

B) 1. Weight
2. Heat

3 A) 1. Because they are heat insulators that prevent the leakage of heat.
2. To prevent mercury from returning back to the bulb quickly.

B) 1. Double-pan scale
2. Spinal cord
3. Celsius
4. Carbon dioxide gas

4 A) 1. (✗) bad
2. (✓)
3. (✓)
4. (✗) mass does not change

B) 1. copper
2. atmosphere

11 Beheira - Official Schools Administration

1 A) 1. spring, Celsius thermometer
2. carbon dioxide, refrigeration
3. manganese dioxide
4. nitrogen 5. 31
6. 10

B) $W_{Earth} = mass \times 10$
$= 6 \times 10 = 60$ N
$W_{Moon} = W_{Earth} \div 6$
$= 60 \div 6 = 10$ N

2 A) 1. (a)
2. (a)
3. (c)
4. (a)
5. (c)

B) 1. To prevent mercury from returning back to the mercury bulb quickly.
2. Because it protects the earth from harmful rays coming from the Sun.

3 A) 1. Heat conductors
2. Ozone
3. Oxyacetylene flame
4. Neuron (nerve cell)

B) 1. Protects the heart and the lungs.
2. Protects the brain

4 A) 1. bad
2. cerebellum
3. nitrogen oxide
4. cerebrum

B) 1. Magnesium oxide (white matter) is produced and carbon deposits on the wall of the cylinder with black color.
2. There will be no life as living organisms will not be able to breathe.